

# Owner's Manual Introduction

Dear FELT Owner,

Thank you for purchasing a FELT bicycle. Your new bicycle is a sophisticated, high-quality machine. Every component of your bicycle, from the frame to the fork and each individual part has been designed, manufactured and assembled with great care. Your FELT dealer gave the bicycle its final assembly and adjustment to guarantee proper operation and many enjoyable riding experiences.

Your owner's manual contains a wealth of information on the proper use of your bicycle, its maintenance and operation as well as interesting information on bicycle design and engineering. We expect that even if you have been a cyclist all your life you will still find informative and useful information within this manual. The forward march of technology has encouraged a sophisticated evolution of the bicycle.

Please take time to read the information titled, **"Before your FIRST ride."**

In order to ensure proper operation of your bicycle and an optimal riding experience, be sure to read the section titled, **"Before EVERY ride."**

You will find important information about tire inflation and chain lubrication in this manual as well.

Parents are responsible for ensuring their children learn how to ride their bicycle safely. Teach your child basic cycling skills and the rules of the road in a place away from traffic before allowing them on city streets. The laws regarding cycling differ from state to state and country to country. Make sure you familiarize yourself with the laws regarding cycling in your country.

We have included helpful information regarding the maintenance of your bicycle. While many principles of operation remain consistent from one bicycle to another, the operation of individual components may vary widely. Do not assume that the information we have included here regarding your bicycle is applicable to all other bicycles.

Though we endeavoured to include helpful information on bicycle maintenance, additional instructions may be necessary for those previously unfamiliar with bicycle maintenance. While some operations may be carried out with only a few tools, a lot of maintenance work on your bicycle requires specialised tools which you should purchase from your FELT dealer. There are several very fine books regarding bicycle maintenance procedures available and your Felt dealer may stock one or more of them as well.



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Before you go on a ride, we strongly encourage you to consider your safety by doing the following:

- Always ride with a properly sized and adjusted helmet **(a)**.
- Wear straight-cut trousers or cycling-specific shorts.
- Wear shoes with a non-slip, firm sole.
- FELT also recommends wearing protective glasses.

Always ride carefully on public roads and observe the traffic rules so as not to endanger yourself or others.

Please be aware that cycling is a hazardous activity that requires the rider to stay in control of his or her bike at all times. Therefore always ride carefully and respect the other traffic participants.

Never ride under the influence of prescription drugs, drugs, alcohol or when you are tired. Do not ride with a second person on your bike and never ride without having your hands on the handlebar.

Observe the legal regulations concerning on-road **(b)** and off-road cycling **(c)**. These regulations may differ in each country. Please respect nature when riding off-road. Only use your bike on signposted, hard-surface roads or bike lanes.



If you have bought a children's bike, be sure to read the chapter **“Children's bikes”**.

There are special traffic regulations for children in some countries. Please read the named chapter first before your child is doing his/her first ride.

## Componentry

We would like to familiarize you with the components used on your bicycle. Please unfold the cover of this booklet. You will see a diagram of a bicycle showing each component found on your bicycle. Leave the page unfolded as you read so that you can easily located the components as they are referred to in the text. The picture may not look exactly like your bicycle; it is meant to serve as a point of reference for the basic operation of the bicycle. There are many types of bicycles and some of them may feature componentry unlike that found on your bicycle.

## Before your first ride

- Our bikes are designed for a maximum total weight (rider, baggage and bicycle together) of:  
125 kg for BMX and hybrid bikes, cruiser bikes and MTBs  
40 kg for 20" children's MTBs,  
55 kg for 24" children's MTBs  
105 kg for road, triathlon and track bikes  
**The permissible baggage weight is marked on the pannier rack.**
- Road (a) and triathlon bikes** are exclusively designed for use on roads with a smooth, hard surface.

**Hybrid, cruiser (b)** and children's bikes are intended for hard surface roads and paths.

**Mountain bikes (c)** are also suitable for off-road use, but not for competitive cycling, especially downhill races, free riding, jumps, dual slalom and trick rides.

**BMX bikes (d)** are intended for the use in secured areas. There are different types either equipped for show riding on smooth ground, for jumps and freestyle on special obstacle courses or for races.



Only use your FELT bike for its intended purpose, as it may otherwise not stand up to the stress and fail! In case you will use your bike for another than its intended purpose, the warranty will become void.



*Before carrying baggage with your FELT bike, please have a look at your bike card and the chapter "Transporting baggage" or contact your FELT dealer under the address given at the end of this booklet.*



*FELT bikes are exclusively designed for being used as sports equipment. They are not intended for the transport of children.*

Please observe the traffic rules when riding on public roads.



*When you are riding in dark or dim conditions, see to it that the bike is equipped with the necessary lighting and reflectors. Turn on the lights in time.*



3. Are you familiar with the brake system? Check whether the lever of the front brake is in the position you are used to (right or left). If this is not the case, you will need to learn to get used to it, as inadvertent use of the front brake can throw you off your bike! Or ask your FELT dealer to switch the brake levers.

Your new bike is equipped with modern brakes which may be far more powerful than those you are used to! **(a)** Be sure to first practise using the brakes away from public roads!



*Please be aware that you cannot reach the brake levers as quickly as usual, if you are riding with your hands e.g. on the bar ends of a MTB or on the aerodynamic handlebar **(b)** of a time trial bike. The brake levers are not always handy.*

You will find more information about brakes in the chapter titled “The brake system”.

4. Are you familiar with the type and functioning of the gears? If not, make yourself familiar with the gears in a place free of traffic.

You will find more information about gears in the chapter titled “The gears”.



a



b

5. Are the saddle and handlebars properly adjusted? The saddle should be set to a height from which you can just reach the pedal in its lowest position with your heel. Check whether your toes reach to the floor **(c)** when you are sitting on the saddle. Your FELT dealer will be pleased to help you, if you are not happy with your seating position. You will find more information on this in the chapter titled “Adjusting the bike to the rider”.

6. If your bike is equipped with clipless or step-in pedals: Have you ever tried the shoes they go with? First practise locking one shoe into a pedal and disengaging it while standing on the other leg. You will find more information on this in the chapter titled “Pedals and shoes”. Be sure to also read the enclosed operating instructions for the pedals delivered by your FELT dealer.



*A lack of practice when using clip-less pedals or too much spring tension in the mechanism can lead to a very firm connection, from which you cannot quickly step out. You might fall off the bike!*

7. If you have bought a FELT suspension bike, you should ask your FELT dealer to adjust the suspension mechanism to your needs **(d)**. Improperly adjusted suspension components are liable to malfunction or become damaged. In any case they will impair the performance of your bike as well as your safety whilst riding. You will find more information on this in the chapters “The suspension fork”, “The suspension seat post” and “The rear shock”.



c



d

## Before every ride

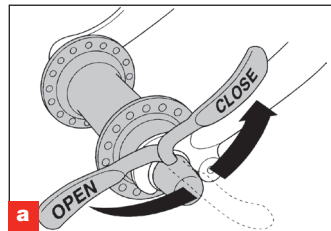
Check the following points before setting off:

1. Are the quick-release levers **(a)** of the front and rear wheel properly closed and the bolts of the seat post and other components tightened? For more information see the chapter **"How to use the quick-releases"**.



**Improperly closed quick-releases can cause components to come loose. This can cause a serious accident!**

2. Are the tires in good condition and do they have sufficient pressure? Make a "thumb test" **(b)**. The tire should only yield a little. For more information see the chapter **"The wheels and tires"**.
3. Spin the wheels to check whether the rims are true. Watch the gap between rim and brake pad or, in the case of disc brakes, between frame and rim or tire. Untrue rims can be an indication of tires with ruptured sides or broken axles or spokes. For more information see the chapter **"The wheels and tires"**.



4. Test the brakes while standing by firmly pulling the brake levers towards the handlebars. The brake pads of rim brakes must hit the rim with their entire surface without touching the tire.

With disc brakes you should have a stable pressure point. Make sure the hydraulic lines do not show any leakage. You should not be able to pull the lever all the way to the handlebars. For more information see the chapter **"The brake system"**.

5. If you want to ride on public roads, you must equip your FELT bike according to the regulations of your country. Riding without a light and without reflectors in dark or dim conditions is very dangerous, because you will too late or not at all be seen by other road users. A lighting set that corresponds to the regulations is a must on public roads **(c)**. Turn on the lights as soon as dusk sets in. For more information see the chapter **"Legal requirements for riding on public roads"**.



6. Let your FELT bike bounce on the ground from a small height **(a)**. If there is any rattling, see where it comes from. Check the bearings and bolts, if necessary.
7. If your FELT bike has suspension, check the frame: Press down on your bike and see whether the spring elements retract and extend as usual **(b)**. You will find more information on this in the chapters “**The suspension fork**”, “**The suspension seat post**” and “**The rear shock**”.
8. If your bike has a kick-stand **(c)**, make sure it is fully raised before you set off. There is a high risk of an accident, if the kickstand is left down when ridden!
9. Do not forget to take a high quality lock **(d)** with you on your ride. The only way to effectively protect your FELT bike against theft is to lock it to an immovable object.



**Do not use your FELT bike, if it fails on one of these points! If in doubt, contact your FELT dealer! A defective bicycle can lead to serious accidents!**



**During use your FELT bike undergoes stress resulting from the surface of the road and the rider's actions. Due to these dynamic loads, the different parts of your bike react with wear and fatigue. Please check your FELT bike regularly for wear marks as well as for scratches, dents, bent parts and any indications of cracking. Parts which have reached the end of their lifespan may break without previous warning. Let your FELT dealer maintain and check your FELT bike regularly and in cases of doubt, it is always best to replace parts.**



## After an accident

1. Check whether the wheels are still firmly fixed in the drop-outs and whether the rims are still centred with respect to the frame or fork. With rim brakes spin the wheels and watch the gap between rims and brake pads **(a)**. If the width of the gap changes markedly and you have no way to true the rim where you are, you will need to open the brakes a little so that the rim can run between the brake pads without touching them. In this case remember that the brakes will not act as powerfully as you are used to. For more information see the chapters **“The brake system”** and **“The wheels and tires”**.
2. Check that handlebars and stem are neither bent nor damaged and that they are level and upright. Check also whether the stem is firmly fixed in the fork by trying to twist the handlebars against the front wheel **(b)**. Also, briefly lean on the brake levers to make sure the handlebars are firmly fixed in the stem. For more information see the chapters **“Adjusting the bike to the rider”** and **“The headset”**.



3. See whether the chain still runs on the chainrings and sprockets. If your bike fell over to the chain side, check that the gears still function properly. Ask somebody to lift the bike by the saddle, then gently shift through all the gears. Pay particular attention when shifting to the small gears, making sure the gear changer does not get too close to the spokes as the chain climbs onto the larger sprockets **(c)**. If the derailleur or the drop-outs have been bent, this can cause the gear changer to collide with the spokes – resulting in a risk of an accident! This in turn can destroy the gear changer, the rear wheel or the frame!

Check the derailleur function, as a damaged gear changer can throw off the chain, thus interrupting the power train of the bicycle. For more information see the chapter **“The gears”**.

4. Make sure the saddle is not twisted using the top tube **(d)** or the bottom bracket shell as a reference.

5. Lift your FELT bike up a few centimetres and let it bounce onto the ground **(a)**. If this causes any sort of noise, search for loosened bolts or components.
6. Check that the mudguards (if fitted) still maintain their regular distance from the tires **(b)**. If not, realign them.
7. Finally, take a good look at the whole FELT bike to detect any deformations, discolouration or cracks.
8. In the case of full suspension bikes check by looking from the rear of the bike whether the rear shock is correctly aligned. The fixing points should be perfectly above one another.

Ride back very carefully by taking the shortest route possible, even if your bike went through this check without any problems. Do not accelerate or brake hard and do not ride your bike out of the saddle.

If you are in any doubt about the performance of your FELT bike, go and see your FELT dealer, do not take a chance.



*Bent parts, especially parts made of aluminium and carbon can break without further warning. They must not be repaired, that means they must not be realigned as the risk of breakage would still remain. This applies in particular to forks, handlebars, stems, crank sets and pedals. When in any doubt, for your safety's sake, always choose to have these parts replaced.*



*Parts made of carbon do not show visible deformations after overstress. They may have sustained damage nevertheless and can brake without previous warning. For more information see the chapter "Special characteristics of carbon".*

## How to use the quick-releases

As the use of quick-releases is not always common knowledge, they have been the cause of accidents. Please learn their correct usage and handling.

**Quick-release retention mechanisms essentially consist of two operative elements:**

1. The hand lever on one side of the hub which creates a clamping force via a cam when you close it.
2. The tightening nut on the other side of the hub with which the initial tension on the threaded rod is set.



*Make sure the levers of both quick-releases are always on the side opposite to the chain. This will help you to avoid mounting the front wheel the wrong way round. By contrast, with disc brakes, the front quick-release has to be mounted with the lever to the right.*

### How to fasten components securely

Open the quick-release **(a)**. The word "Open", printed on the lever, should become visible now. Move the lever back, as if to close it. Now you should be able to read "Close" on the outside of the lever. From the start of the closing movement up to about the first half of its travel the lever should move very easily, i.e. without clamping the wheel **(b)**.

Over the second half of its travel the force you need to move it should increase considerably. Towards the end of its travel the lever should be very hard to move.



Use the ball of your thumb to push it in all the way while your fingers pull on an immovable part, such as the fork or a rear stay **(c)**, but not on a rotor or spoke. In its end position, the lever should be parallel to the bike, i.e. it should not stick out to the side. The lever should lie close to the frame so that it cannot be opened accidentally.

To check whether the lever is securely locked try to turn it while it is closed. Apply pressure to the end of the hand lever **(d)**.

If you can turn the lever around, the wheel is not securely fastened. Open the lever again and screw the tightening nut clockwise by half a turn to increase the initial tension.

Close the lever again and check it again for tightness. If the lever can no longer be turned, it is properly fastened.

Finally lift the bike a few centimetres so that the wheel no longer touches the ground and hit the tire from above. If it is properly fastened, the wheel will remain firmly fixed in the drop-outs of the frame. If your seat post is equipped with a quick-release retention mechanism, check whether the saddle is firmly fixed by trying to twist it relative to the frame.



*Quick-releases that have not been closed properly can cause parts to come loose, creating an imminent risk of accident!*

## How to mount thru axle wheels

With the conventional thru axle system slide the thru axle through fork and hub in a way that the head of the Allen bolt **(a)** comes to a rest on the right side, (the chain side of the bicycle).

Once the axle is mounted, gently cycle the fork a few times, thus excluding the chance of the axle getting jammed. Screw the nut onto the axle and tighten it according to the enclosed instructions of the fork manufacturer.

To lock the axle, finish by tightening the four Allen bolts at the front of the fork, according to the enclosed instructions of the fork manufacturer.

Check the bolts after one to two operating hours and then every 20 hours.

If your bike is equipped with a **Maxle thru axle system** with quick-releases, put the wheel into the fork and mount the rotor in the brake calliper **(b)**. Bring the wheel into the correct position between the drop-outs and slide the axle with the open Maxle quick-release lever from the right side through the drop-out and the hub.

As soon as the axle thread engages with the thread of the left drop-out, tighten it by turning the whole Maxle clockwise until tight.

Close the Maxle thru axle quick-release lever like a usual quick-release lever. From the start of the closing movement up to about the first half of its travel the lever should move very easily without clamping the wheel, whereas over the second half of its travel the force you need to move it should increase considerably. Towards the end of its travel the lever should be very hard to move. Use the palm of your hand while your fingers pull on an immovable part, such as the fork leg, but not on a spoke or the rotor. In its end position the quick-release lever should be tight so that it can no longer be turned.



***Do not use any other tools to fix the axle. A too tight fixing of the axle can damage the axle or the fork leg.***



***In any case make yourself familiar with the user manual of the respective fork manufacturer.***





## Adjusting the bike to the rider

Your body height is the decisive criteria for the frame size you need for your FELT bike. Make particularly sure you have enough clearance between your crotch and the top tube so that you do not hurt yourself if you have to get off your bike quickly **(a)**.

By choosing a specific type of bike you have already roughly determined the posture you will be riding in **(b)**. However, some components of your FELT bike are designed in a way that you can adjust them to your proportions up to a certain degree. These include the seat post and saddle, the stem and the brake levers.



*All tasks described in the following require experience and appropriate tools. Tighten bolted connections with particular care. Increase the torque bit by bit, checking the fit of the components in between. Use a torque wrench and never exceed the maximum permissible torque! You will find a table of torques in the chapter "Recommended torques for bolted connections" and in the manuals of the component manufacturers.*

After carrying out assembly work, always make a short functional check as described in the chapter **"Before every ride"** and do a test ride in an area away from traffic. This will allow you to safely check whether everything is in good order.



If you are unsure, it will be better to ask your FELT dealer to make the amendments you want. They can implement any amendments the next time you take your bike to them, e.g. for the first inspection.



*If you have a very small frame, there may be a danger of your foot colliding with the front wheel when turning. Check the position of your cleats (the plates on the soles of your cycling shoes), if this applies to your bike.*

## Adjusting the saddle to the correct height

The correct saddle height for almost all bicycle types is the height which gives maximum pedalling comfort and efficiency. When pedalling, the ball of your big toe should be positioned above the centre of the pedal spindles. With your feet in this position you should not be able to stretch your legs completely straight at the lowest point, otherwise your pedalling will become awkward. You can check the height of your saddle in the following, simple way. This is best done wearing flat-soled shoes.

With mountain bikes a lower saddle height is often better for some riding manoeuvres. A lower saddle is advisable in particular for riding steep descents or very technical sections. However prolonged riding with a low saddle may cause knee trouble.

Sit on the saddle and put one of your heels on the pedal at its lowest point. Adjust the saddle height so that in this position your leg should be fully stretched and your hips should remain horizontal **(a)**.

To modify the saddle height, loosen the seat clamp binder bolt (using a suitable tool) by turning it anticlockwise by two to three turns, or by using the quick-release lever if fitted (first read the chapter: **"How to use the quick-releases"**).


**a**

**a**

Now you can adjust the saddle height to the desired position.

Be sure not to pull the seat post out too far. The mark on the seat post (max., min., stop) should always remain within the seat tube.

In the case of frames with seat tubes that extend beyond the top of the frame's top tube, the FELT seat post should be inserted into the seat tube at least a few millimetres below the bottom of the top tube and below the top of the seat stay junction! This can mean a minimum insertion length of 10 centimetres (4.5 in.) or more.

Make sure the part of the seat post inside the seat tube is always well greased (except for carbon seat posts or frames. They must not be greased!). Do not use brute force, if the seat post does not move easily inside the seat tube or it cannot be tightened sufficiently, ask your FELT dealer for advice.

Align the saddle with the frame by using the saddle nose and the bottom bracket or top tube as a reference point **(b)**.

Clamp the seat post tight again by turning the seat post binder bolt clockwise **(c)**. With the quick-release, you do not need much strength in your hands to clamp the seat post sufficiently tight.


**b**

**c**

Verify that the seat clamp is sufficiently tight by taking hold of the saddle at both ends and then trying to rotate the seat post inside the seat tube **(a)**. If it does rotate, you will have to retighten the clamping bolt or quick-release, and do the check again.

Does the leg stretch test now produce the right result? Check by moving your foot and pedal to the lowest point. When the ball of your foot is exactly above the pedal centre in the ideal pedalling position, your knee should be slightly bent. If this is the case, you will have adjusted the saddle height correctly **(b)**.

Check whether you can touch the ground safely while sitting on the saddle by stretching your feet to the floor. If not, you should lower the saddle until you can, at least to begin with.



**Never ride your bike with the seat post drawn out beyond the limit, maximum, or stop mark **(c)**! The seat post might break or cause severe damage to the frame.**

In the case of frames with seat tubes that extend beyond the top of the frame's top tube, the FELT seat post should be inserted into the seat tube at least a few millimetres below the bottom of the top tube and below the top of the seat stays!



**If sitting on the saddle causes you trouble e.g. because it numbs your crotch, this may be due to the saddle, or its position. Your FELT dealer has a very wide range of saddles available, and can offer advice on position. They will be pleased to advise you.**



**Never apply grease or oil to a seat tube of a frame made of carbon, unless an aluminium sleeve is inside the frame. If you mount a carbon fibre seat post, do not put any grease on it, even if the frame is made of metal. Greased carbon may never again afford a safe clamping joint. Please use special assembly pastes **(d)** instead which your FELT dealer keeps for sale.**



**The seating position on BMX bikes is not entirely comparable to that on any other bikes. Riding a BMX bike means maximum control and maneuverability of the bike. Such a seating position does not provide ideal pedalling comfort when riding longer distances.**



## Adjusting the height of the handlebars

The height of the handlebars determines how much your upper body will be inclined forward. Lowering the handlebars gives the rider a streamlined position and brings more weight to bear on the front wheel. However, it also entails an extremely forward leaning posture which is tiring and less comfortable, because it increases the strain on your wrists, arms, back, upper body and neck.

Especially for riding downhill on a mountain bike an extremely upright sitting position is very enjoyable for the rider. He is less prone to overturning

In the case of threadless systems **(a)**, such as the “Aheadset System”, the stem forms part of the headset. Adjusting the height of this type of stem is more difficult, because it means dismantling and reassembling the stem and adjusting the headset. The adjustment is a job best left to a skilled FELT bike mechanic.

Handlebars with conventional stems **(b)** allow limited adjustment of height. This is done by moving the stem up or down inside the fork stem.

To change the height of the handlebar with an adjustable stem **(c)** all you have to do is loosen and retighten a few bolts.



*The stem is one of the load bearing parts of your bike and changes to it can impair your safety. If you are not sure about how to adjust the stem, your FELT dealer will be pleased to help you.*

Regardless of the system your FELT bike is equipped with, please check after any adjustment whether all fastenings are firmly tightened.

Note that the bolted connections of stem and handlebars have to be tightened to the specified torques. You will find the prescribed values in the chapter “**Recommended torques for bolted connections**” or directly on the parts. If you disregard the prescribed values, handlebars or stem may come loose or break.

Stems come in varying lengths as well as shaft and binder tube diameters. A stem of inappropriate dimensions can become a serious source of danger: For example, the handlebars or stem can be damaged or cause an accident. Check whether the area of the stem where the handlebars are clamped has no sharp edges. Ask your FELT dealer for advice.

## Adjustable stems

There are various solutions for adjusting the tilt of the front part of the stem:

Some designs use bolts on the sides of the joint **(a)**, others have bolts coming from above or below **(b)**, and some versions are equipped with additional locking mechanisms or adjusting bolts.

Ask your FELT dealer to explain you the function and adjustment of your stem or let him do that work.

If the joint has a side clamping bolt, release the bolt by two to three turns at the most, i.e. without unscrewing it all the way. If you still cannot move the stem, it is being held in place by a ratchet or integrated locking mechanism. If the stem is fitted with a locking mechanism, release the holding bolt located on the top or bottom side of the stem a little. In the case of a ratchet mechanism you will find the bolt on the side.

Adjust the stem according to your needs.



Gently tighten the bolt of the locking mechanism again, until it engages. Bolts located on the side only have to be tightened gently. If there are no side bolts, you have to tighten the bolt of the locking mechanism. If the stem of your bike has a ratchet mechanism, make sure its surfaces engage snugly as you tighten the side bolt. Also tighten the bolt on the side of the joint, if this is applicable.

Any bolts located on the top or bottom side of the stem have to be released as far as it is necessary to disengage the ratchet mechanism and move the front part. It is usually not necessary to remove the bolts completely. Retighten the bolts after setting the stem to the desired height.



**Changing the position of the stem alters the position of handlebars, brake and gear levers. Readjust them as described in the chapter "Adjusting the tilt of the handlebars etc." further below.**



**Note that the bolted connections of adjustable stems and handlebars all have to be tightened to their specified torques. You will find the prescribed values in the chapter "Recommended torques for bolted connections" or directly on the parts. If you disregard the prescribed values, the handlebars or stem may come loose or break.**

## Conventional stems

Release the expander bolt by two to three complete turns **(a)**. You should now be able to turn the stem freely inside the fork.

If this is not the case, release the bolt by tapping it gently with a hammer. With most Allen bolts, you will first need to stick the Allen key into it again because it will probably be countersunk and therefore impossible to be hit directly. Then gently tap the key with the hammer **(b)**.



**Never try to unscrew the top race when you only want to adjust the stem, as you will otherwise alter the bearing play.**

Now you can move the handlebars and stem up and down as a whole. Do not pull the stem out beyond the indicated mark on the shaft!

Setting the stem to a lower position can only add to your safety **(d)**!

Straighten the handlebars so that they are symmetrical with respect to the front wheel. Check from the top whether both handlebars and stem are correctly positioned with respect to the front wheel **(c)**.

Tighten the expander bolt with a torque wrench. Do not exceed the maximum permissible torque.



Make sure the stem is firmly fixed by taking the front wheel between your legs and trying to turn the handlebars and stem relative to the wheel. If the stem gives way, you have to retighten the bolt.

If the handlebars are still too high or too low, the only solution will be to replace the stem. This can be quite a big job, as it may mean taking off and remounting all the fittings on the handlebars. Ask at your FELT dealer about the various stem types available.



**Never ride a bike with a stem that has been drawn out beyond the mark for the maximum permissible height **(d)**! Check all bolted connections and test your brakes before you set off!**

## Stems for threadless systems, the Aheadset® system

(\*Aheadset is a registered trade mark of the Dia-Compe company which invented the threadless fork tube system.)

On bikes with an Aheadset the stem also serves to adjust the initial headset bearing pressure. If you change the position of the stem, you have to readjust the bearings (see the chapter **"The headset"**). The vertical setting range is determined by the intermediate rings, also referred to as spacers. In the case of flip-flop stem models it is also possible to mount the stem the other way round to achieve a different handlebar height.

Release the bolt at the top of the fork tube which serves to adjust the initial bearing pressure and remove the Ahead cap **(a)**.

Release the bolts on either side of the stem and pull the stem off the fork. Now you can remove the spacers **(b)**.

You can determine the handlebar height by the arrangement of stem and spacers. Slip the remaining spacers onto the fork tube above the stem.

If you want to turn the stem around, you also have to release the bolts securing the handlebars. If the stem is fitted with a cap, you can simply take out the handlebars at this point. If it is not fitted with a cap, you have to remove the handlebar fittings (see the instructions in the chapters further below).



*If the stem is turned around, it is possible, that the cables are too short. In this case riding can be unsafe. Ask your FELT dealer for help.*

After turning the stem around, centre the handlebars and tighten the bolt again.

Readjust the bearing **(c)**, align the stem and then tighten it (see the chapter **"The headset"**) **(d)**.

Check whether the handlebars are firmly seated in the stem by trying to rotate the handlebars downwards. Also check whether the handlebar/stem unit can be twisted relative to the fork. Do this by holding the front wheel between your knees and trying to twist the handlebars. If there is movement, carefully tighten the bolts a little more and check again. Do not go beyond the maximum permissible torque!



*When completely removing the spacers you will have to shorten the fork tube. This change is irreversible and in any case best left to an expert. When you are sure of the position you want, ask your dealer to do the job for you.*





## Correcting the fore-to-aft position and horizontal tilt of the saddle

The inclination of your upper body, and hence your riding comfort and pedalling power, are also influenced by the distance between the grips of the handlebars and the saddle **(a)**. This distance can be altered slightly by changing the position of the saddle rails in the seat post clamp. However, this also influences your pedalling. Whether the saddle is positioned more to the front or to the back of the bike will alter how rearward the pedalling position of your legs is.

You need to have the saddle horizontal **(b)** in order to pedal in a relaxed manner. If it is tilted forwards, you will constantly have to lean against the handlebars to prevent yourself from slipping off the front of the saddle.

Please note that the saddle position may vary, in particular with mountain bikes.



*The setting range of the saddle is very small. Replacing the stem allows you to make far bigger adjustments to the riders fore-to-aft position, because stems come in different lengths. In doing so you may achieve differences of more than ten centimetres. In this case you usually would have to adjust the length of the cables – a job best left to your FELT dealer!*



a



b



c



*Note that the bolted connections of the seat post have to be tightened to the specified torques. You will find the values in the chapter “Recommended torques for bolted connections” and in the enclosed instructions or directly on the parts.*



*Check these bolts monthly with a torque wrench according to the prescribed torque.*



*Make sure the saddle is not clamped on the curved sections of the saddle rails **(c)**.*

## Adjusting saddle position and tilt

### *Patent clamping with one bolt or two parallel bolts*

With so called patent seat posts one or two bolts secure the clamping mechanism, which controls the tilt and the horizontal position of the saddle.

Release one or both bolts at the top of the seat post. Undo the bolt(s) two to three turns anticlockwise at the most, otherwise the whole assembly can come apart.

Move the saddle forward or backward as desired. You may have to give the saddle a light tap to move it.

Make sure the seat of the saddle remains horizontal as you tighten the bolt(s). The bike should also stand on level ground while you adjust the saddle.

Retighten the bolt(s) with a torque wrench according to the instructions of the manufacturer **(a)**.

After fastening the saddle, check whether it resists tilting by bringing your weight to bear on it once with your hands at either end of the saddle **(b)**.



### *Clamping with two bolts in line*

Release both bolts at the top of the seat post. Turn the bolts two to three turns anticlockwise at the most, otherwise the whole assembly can come apart. Move the saddle forward or backward as desired to adjust the horizontal position.

Tighten both bolts equally so the saddle remains at the same angle.

If you wish to lower the nose of the saddle a little, tighten the front bolt more. You might have to loosen the rear bolt a little as well.

To lower the rear part of the saddle, the rear bolt has to be tightened more. You might have to loosen the front bolt a little as well.

Having found your preferred position, make sure both clamps are correctly aligned with the saddle rails before tightening the bolt(s) to the correct torque setting as prescribed by the manufacturer **(c)**.

After fastening the saddle, check whether it resists tilting by bringing your weight to bear on it once with your hands on the tip and once at the rear end **(d)**.



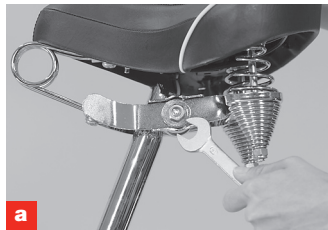
## Clamping with saddle clamp

Another version is the saddle clamp which usually has two nuts seated on a single through bolt. Release the nuts no more than two to three turns to begin with, otherwise the whole assembly can come apart **(a)**.

Move the saddle forward or backward as desired. You may have to give the saddle a light tap to move it.

Make sure the seat of the saddle remains horizontal as you tighten the bolt(s). The bike should also stand on level ground while you adjust the saddle.

Retighten the bolt(s) with a torque wrench according to the torque given by the manufacturer **(b)**. After fastening the saddle, check whether it resists tilting by bringing your weight to bear on it with your hands at either end of the saddle.



a



b

## Adjusting the reach distance of the brake levers

With most brake systems the distance between the brake levers and the handlebar grips is adjustable. This gives riders with small hands the convenience of being able to bring the brake levers closer to the handlebars. The length of the rider's fingers also determines how the lever position for first brake contact should be set.

Determine the point, front and rear, at which the brake pads touch the braking surfaces. If this point is reached after the lever has only travelled a short distance, you will have to readjust the brakes when altering the reach distance (see the chapter **"The brake system"**). Otherwise the brakes could rub on the rim or on the braking surfaces after you have changed the gripping distance.

On most bikes there is a small (headless) screw near the point where the brake cable **(c)** (the hydraulic brake cable) **(d)** enters the brake lever mount. Turn the bolt clockwise and watch how the lever adjusts as you do so.

When you have set the levers to the desired reach distance be sure to check whether there is still enough slack for the brake levers to move a little before the brake pads hit the rims (for more information see the chapter **"The brake system"**).



**You should not be able to pull the brake levers all the way to the handlebars. Your maximum brake force must be reached before this point!**



c



d

## Adjusting the tilt of the handlebars, bar ends and brake levers

The handlebars of mountain and BMX bikes are usually slightly bent at the ends. Set the handlebars to a position in which your wrists are relaxed and not turned outwards too much.

To adjust the angle of the handlebar, release the Allen bolt(s) on the underside or front of the stem.

Rotate the handlebars to the desired position.

Make sure the handlebars are accurately centred in the stem.

Now carefully tighten the bolts with a torque wrench **(a)**. Try rotating the handlebars once clamped in the stem and tighten the bolt a little more if necessary. Observe the maximum torque (see the chapter “**Recommended torques...**”) indicated in the enclosed instructions or the values printed directly on the components.

After adjusting the handlebar, you may also need to readjust the brake and gear levers.

Release the Allen bolt at the brake or gear lever clamps.

Turn the levers relative to the handlebars. Sit in the saddle and place your fingers on the brake levers. Check whether the back of your hand forms a straight line with the line of your forearm **(b)**.

Re-fasten the levers and do a twist test to check they do not move.



**Note that the bolted connections of the stem, handlebars, bar ends, and brakes have to be tightened to their specified torques (c). You will find the prescribed values in the chapter “Recommended torques for bolted connections”, in the enclosed manuals or directly on the parts.**



Bar ends give you additional ways of gripping the handlebars.

They are usually fixed in a position that gives the rider a comfortable grip **(a)** when pedalling out of the saddle, i.e. almost parallel to the ground or tilted slightly upwards.

Release the bolts, which are usually located on the underside of the bar ends, by one to two complete turns.

Turn the bar ends to the desired position making sure that the angle is the same on both sides **(b)**. Retighten the bolts to the required torque **(c)**.

Check whether the bar ends are firmly fixed by trying to twist them out of position.



*Note that the distance you need to stop your bike increases, while riding with the hands on bar ends. The brake levers are not handy in all handlebar positions.*



*Keep in mind that not all handlebars are suitable for being equipped with bar ends. Ask your FELT dealer for advice.*



*Note that the bolted connections of the handlebars and bar ends have to be tightened to their specified torques. You will find the prescribed values in the chapter "Recommended torques for bolted connections", in the enclosed manuals or directly on the part.*


**a**

**b**

**c**

## Adjusting the braking response with road, triathlon and cyclocross bikes

Riders with small hands should check the lever position at the point the brake pads have first contact with the rim. This distance should be adjusted by the FELT dealer to the length of the rider's fingers directly when buying the bike. This adjustment is made with the clamping bolt directly at the brake **(a)**. The knurled knob or nut you will find there is only to readjust the brake, if the brake pads wear out.

Be sure to check whether there is still enough slack for the brake levers to move a little before the brake pads hit the rim **(b)**. Check the point, front and rear, at which the brake pads touch the rims. If this point is reached after the lever has only travelled a short distance, you will have to readjust the brakes (see the chapter "The brake system"). Otherwise the brakes could rub on the rim if you ride out of the saddle.



**You should not be able to pull the brake levers all the way to the handlebars. Your maximum brake force should be reached before this point!**



**Shimano offers Dual Control levers which match small hands. If you have problems reaching the brake lever, ask your FELT dealer.**



**With the SRAM Red group the lever position is adjustable. Ask your FELT dealer for help.**

**a****b**

## Adjusting the tilt of the handlebars and brake levers with road, triathlon and cyclocross bikes

### Road handlebars

With road bikes, the straight extension below the drops should be parallel to the ground or slant slightly downwards towards the rear **(c)**. The tips of the brake levers should coincide with an imaginary straight line extending forward from the bar ends. Shifting the brake levers is a job best left to your FELT dealer, as it involves retaping the handlebars afterwards.

To adjust the tilt of the handlebars, release the Allen bolt(s) on the underside or front of the stem. Turn the handlebars to the desired position. Make sure the handlebars are accurately centred in the stem.

Now carefully tighten the bolt(s) with a torque wrench. Try twisting the handlebars inside the stem and tighten the bolt a little more, if necessary **(d)**. Retighten the bolts, if necessary.



**Note that the bolted connections of the stem and handlebars have to be tightened to the specified torques. You will find the prescribed values in chapter "Recommended torques for bolted connections", in the enclosed manuals or on the components.**

**c****d**

### Triathlon handlebars

In triathlons and time trials (training and competition) **(a)**, where a particularly aerodynamic seating position is important, so called aero handlebars are used **(b)**. With these aero models the gear levers are often positioned at the handlebar ends. When you ride with your back in a horizontal position and hands on the aero bars, the brake levers are out of reach and the reaction time is extended which makes your stopping distance longer. For this reason it is very important for you to ride with caution and with this fact in mind.

Within certain limits, the position of the aero handlebars can be adjusted according to your personal preferences. That is to say the straight part of the aero handlebars should point slightly downward or upwards, with the upward inclination not exceeding 30 degree. Make sure your forearms are always comfortably rested, i.e. the elbows should be off the armrests a little towards the rear. The basic bullhorn handlebar should be aligned parallel to the lane. In this position, the ends generally point upwards.

To adjust the angle of the handlebars, release the Allen bolt(s) on the underside or front face of the stem and/or of the aero handlebar.

Turn the handlebars to the desired position.

Make sure the handlebars are accurately centred in the stem.



Now carefully tighten the bolt(s) with a torque wrench. Try rotating the handlebars within the stem clamp and tighten the bolt a little more, if necessary **(c)**.



**Note that the bolted connections of stem and aero handlebars have to be tightened to the specified torques. You will find the prescribed values in the chapter "Recommended torques for bolted connections", in the enclosed manuals or on the components.**



**The setting options may differ according to the model used. Please read the manual of the aero handlebar/stem manufacturer in any case.**



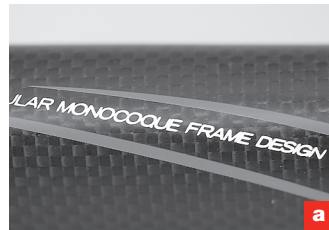
## Special Characteristics of Carbon

Special characteristics of carbon components made of carbon-reinforced plastics also referred to as carbon or CRP for short need to be taken into account:

Carbon **(a)** is an extremely strong material which combines high resistance with low weight. Please note that carbon, unlike metals, shows no visible deformation after overstress even though some of its fibres may be damaged.

This makes it very dangerous to continue using the part after an impact or undue stress, as it may fail without previous warning thereby causing an accident with unforeseeable consequences. Have your carbon bicycle part, or to be certain, the entire FELT bike checked by your FELT dealer for any visible or palpable damage after every crash, collision with an obstacle or accident. They may contact our service department in order to make sure you can have absolute confidence in your bike.

For safety reasons, damaged parts made of carbon must never be repaired. They must be replaced at once! Prevent further use by taking appropriate measures, i.e. saw the component into pieces.



Parts made of carbon should under no circumstances be exposed to excessive heat. Therefore, never have a carbon part enameled or powder-coated. The temperatures required for doing so could destroy it. Do not leave carbon fibre parts near a source of heat e.g. a radiator or in your car during hot or sunny weather.



**Components made of carbon have, like all lightweight bicycle parts, a limited service life. For this reason, change stem and handlebars at regular intervals (e.g. every 3 years), even if they have not experienced any crashes or similar.**



**If carbon parts on your FELT bike should make any creaking or cracking noises or show any external signs of damage such as notches, cracks, dents, discolourations etc., you must not use the bicycle any longer. Please contact your FELT dealer immediately; he will check the part carefully.**



**Make sure all carbon clamping areas are absolutely free of grease and other lubricants. Grease would penetrate the surface of the carbon material, reducing the coefficient of friction and hence impairing the stability of the clamping joint. Greased carbon may never again afford a safe clamping joint. Please use a special carbon assembly paste in clamping areas (b).**





**Protect the exposed areas of your carbon frame (e.g. steerer tube, underside of the down tube etc.) against rubbing cables or stone chips with special pads ((c) on page 26) your FELT dealer keeps for sale. Also keep in mind that carbon is sensitive to pressure. Do not lean your FELT bike carelessly against a post or such like.**

If you intend to equip your carbon frame with components, such as mudguards, pannier racks, kick-stands and lighting sets, you will need the component manufacturer specifications to determine if they are carbon compatible. In general, only frames with special threaded eyes can be equipped with additional accessories.



**Do not mount a carbon frame in the holding jaws of a workstand! It is better to mount it instead by clamping the frame by using a spare aluminium seat post inserted in the frame (a).**


**a**

**b**

## What to bear in mind when braking with carbon wheels

There are some special features with carbon braking surfaces **(b)**. Only use brake pads that are suitable for carbon wheels. It is always advisable to use the brake pads of the wheel manufacturer.

Carbon brake pads usually wear down faster than conventional brake pads.

Keep in mind that the braking response of the rims needs getting used to, in particular under wet conditions. Test your brakes in an area free of traffic until you have full control of your bike.

The brake surfaces of the carbon rims are sensitive to heat. Therefore, when you are riding in the mountains, avoid any drag braking. Riding downhill for example with a permanently activated rear wheel brake might lead to a heating up of the material and thus to a deformation. The rim may suffer serious damage, the tire might burst, thus causing an accident.

Always use both brakes simultaneously and release them intermittently to allow the material to cool off.



**Adapt your riding behaviour to the particularities of braking on carbon material, in particular in the mountains.**



**Check the condition of the brake pads at short intervals, as the wear might be more pronounced as with aluminium rims.**



**Note that your bike's braking power is greatly reduced in wet conditions. Avoid, as far as possible, riding on your bike in damp weather or with imminent rain. If you ride, nevertheless, on wet or moist roads, be particularly cautious and do not ride as fast as under dry conditions.**

## Important information on use, care and maintenance

### The brake system

Brakes are used for adjusting one's speed respective to the surrounding terrain and traffic. In an emergency situation, the brakes must also bring the bike to a halt as quickly as possible. Such emergency braking is also a study in physics. In the process of braking, the rider's weight shifts forward, thus reducing the load on the rear wheel **(a)**. The rate of deceleration is primarily limited by the danger of skidding and sliding, and secondly by the tires' grip on the road. This problem becomes particularly acute when riding downhill. If an emergency braking situation occurs, you have to put your weight back as far as possible on the bike to help maintain rear wheel grip.

Pull both brakes simultaneously. Bear in mind that, due to the weight transfer, the front brakes can generate a far better braking effect.

With all types of rim brakes, long periods of constant braking or a slight and continuous contact of the brake pads with the rim, can overheat the system. This can damage the tube or cause the tire to slip on the inner rim. This may lead to a sudden loss of tire pressure during the ride, possibly resulting in an accident.



With disc **(b)**, drum and roller brakes continuous braking or a constant light use of the brake lead to overheating of the brake system. The consequence of this could be a reduction of braking power or complete failure of the brake system and a serious accident.

Practise your braking skills. Get used to braking hard and then releasing the brake again, whenever the road surface and the situation allows for it. If you are unsure about the braking action, stop and let the brake system cool down.



**Apply the brakes carefully when riding on wet or slippery roads, as the wheels can easily slip away. Generally reduce your speed when riding in such conditions.**



**The assignment of brake lever to brake calliper can vary, e.g. right lever acts on front brake, as is the case in some English speaking countries and with multi-speed hubs. Please make yourself familiar with the lever-to-brake assignment on your FELT bike, or ask your dealer to change the brakes as you want them.**



**Be careful while getting used to the brakes. Practise emergency stops in a place clear of traffic until you are comfortable controlling your bike. This can save you from having accidents in road traffic.**

### Brakes – how they work and what to do about wear

Actuating the hand lever on the handlebars causes a brake pad to be pressed against a brake surface, and the ensuing friction slows down the wheel. If water, dirt or oil gets in contact with one of the braking surfaces, this changes the coefficient of friction and deceleration is reduced. This is why brakes respond with a slight delay and less powerfully in wet weather. This applies above all to rim brakes.

In order to maintain their effectiveness, brakes need to be checked and readjusted regularly. If in any doubt contact your FELT dealer.

## Rim brakes (a)

The friction generated by braking causes wear to the brake pads as well as to the rims. Frequent rides in the rain and dirt can accelerate wear on both braking surfaces. Once the abrasion of the rim has reached a certain critical point, the rim can rupture under the tire pressure. This can make the wheel jam or the tire burst, both of which can cause an accident.

See your FELT dealer and ask them to examine the remaining thickness of the rims when you have worn through your second set of brake pads at the latest. Your dealer will have a special measuring device for determining the remaining thickness of the rims. Some rims are equipped with wear indicators. Ask your FELT dealer to explain them to you.



**Wet weather reduces your braking power. Be aware of longer stopping distances when riding in the rain!**



**When replacing brake pads, be sure to only use brake pads that bear the appropriate mark and match your rim. Use original spare parts to be on the safe side. Contact the manufacturer of the wheels and ask for the brake pads which go with the wheels. Your FELT dealer will be pleased to advise you.**



**Ensure that braking surfaces are absolutely free of wax, grease and oil.**



a



a



**Have your rims regularly inspected and measured by an expert.**



**Brake cables which are damaged, e.g. frayed, should be replaced immediately, as they can otherwise fail in a critical moment, possibly causing a crash.**

If you mount a wheel set with carbon rims **(b)** onto your road or triathlon bike, bear in mind that you might have to mount special brake pads as well. Typical brake pads for aluminium rims probably will not perform at the level needed for a safe ride! Take note of the wheel set manufacturer's user manual.

Practise using the brakes to get used to the modified braking behaviour.

For more information on your brake model, visit the websites of the respective manufacturers, e.g.:

[www.campagnolo.com](http://www.campagnolo.com)

[www.sram.com](http://www.sram.com)

[www.tekro.com](http://www.tekro.com)

[www.shimano.com](http://www.shimano.com)



a



b

## Checking, adjusting and synchronizing V-brakes and cantilever brakes

Common cantilever and V-brake designs have two brake arms mounted separately on either side of the rim. When pulling the brake lever, both arms are connected by the cable, the pads touch the rim.

V-brakes are mounted on MTBs and BMX bikes.

Cantilever brakes are mounted on cyclocross bikes. They are compatible with the Shimano Dual Control/STI gear-brake-levers.

### Functional check

Check whether the brake pads are accurately aligned with the rims and are still sufficiently thick. You can judge the wear of the brake pads by the appearance of the grooves. If the pads are worn down to the bottom of the grooves, it is time to replace them.

The brake pads must hit the rim simultaneously, first touching it with the front portion of their surface. At the moment of first contact the rear portion of the pads should be a millimetre away from the rim. Viewed from above, the brake pads form a “V” with the trough pointing to the front **(a)**. This V-shaped setting prevents the brakes from screeching when applied. To align the brake pads, release the fixing screw, realign the pad and retighten the fixing screw.

The brake lever must always remain clear of the handlebars. You should not be able to pull it all the way to the handlebars even in the event of an emergency stop.

A correctly adjusted brake will match all these points.



*Adjusting the position of the brake pads relative to the rims requires a considerable degree of skill. Replacing and adjusting the brake pads is a job best left to your FELT dealer.*

## Synchronizing and adjusting the brakes

Almost all brake designs have a bolt located next to one or both brake pads for adjusting the initial spring tension **(b)**. Adjust this bolt until the distance between brake pads and rim is the same on either side.

To adjust the brakes, unscrew the knurled lock ring located at the point where the brake cable enters the brake lever on the handlebars.

Unscrew the knurled, slotted adjusting bolt by a few turns. In this way you are reducing the free travel of the brake lever.

Keeping the adjusting bolt fixed, tighten the lock ring against the brake lever mount. This prevents the adjusting bolt from coming loose by itself.

**(a)** page 31

Ensure that the slot of the bolt faces neither forward nor upward, as this would permit water or dirt to enter.



*Always test the brakes' function when stationary after adjusting them, making sure that the brake pads engage fully with the rim when you pull them hard.*

Following the stationary test, check the brakes in a place clear of traffic.



**a**



**b**

### Characteristics of Shimano Nexave brakes and some models from different manufacturers with power modulator

The V-brakes of the Shimano Nexave system and some Dia-Compe models have a power modulator **(b)**, which is located on the upper side of the brake arms or directly integrated into the brake levers. It prevents over-braking of the front wheel and reduces the risk of a crash.

If you want to adjust the power modulator, ask your local FELT dealer for help. If you want to adjust it by yourself, it is absolutely necessary to read the manufacturers' instructions or ask your FELT dealer. After every adjustment, check the brake stationary first and then in a place clear of traffic to get a feeling for it.



### Characteristics of the extra brake levers with cyclocross bikes

Additional brake levers are mounted to the handlebars **(c)** of the cyclocross bike series to ensure braking from a secure handlebar position even when riding in tricky terrain. These brake levers can be used on an equal footing with the other road bike brake levers. It is impossible to simultaneously use both brake levers of one brake.

These brake levers are equipped with adjusting bolts **(d)** which allow for a readjustment of the cable, as described above.



## Checking, adjusting and synchronizing racing or side-pull brakes

With side-pull brakes, the brake arms are suspended from a common point, thus forming an integral system. When pulling the brake lever, both arms are controlled by the cable, the pads then touch the rim.

Check whether the brake pads are accurately aligned with the rims and still sufficiently thick. You can judge the wear of the brake pads by appearance of the grooves. If the pads are worn down to the bottom of the grooves, it is time to replace them **(a)**.

Do the arms contact the rim simultaneously when you pull the brake, and do they stay clear of the tire? The brake lever must always remain clear of the handlebars. You should not even be able to pull them all the way to the handlebars in the event of an emergency stop **(b)**. If your brake passes all these points, it is properly adjusted.

### Vertical adjustment of the brake pads

Release the fastening screw of the brake pad by one, to at most two, complete turns.

Push the brake pad to the required height and align it according to the rim before tightening the fastening bolt again.



## Synchronizing and adjusting the brakes

With dual pivot brakes, turn the small (headless) screw, located at the side or on top of the calliper, until the left and right brake pad are at the same distance from the rim.

Furthermore check whether the bolt, connecting the brake to the frame or fork, is still tightened to the prescribed torque **(c)**.

To adjust the brake, turn the knurled nut or bolt through which the brake cable passes at the yoke until the travel of the brake lever suits your needs **(d)**.



***Always test the brakes in stationary position first after adjusting them, making sure that the brake pads engage fully with the rim without touching the tire when you pull them hard. Make sure you cannot pull the lever all the way to the handlebars.***

Following the stationary test, check the brakes in a place clear of traffic





## Checking, adjusting and synchronizing U-brakes

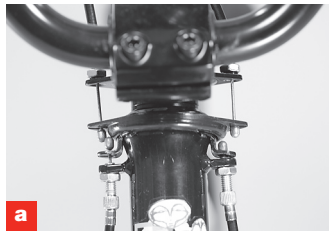
Many BMX bikes are equipped with a rotor (also known as a gyro) **(a)** connected to the brake callipers, also referred to as U-brakes. Common U-brake designs have two brake arms mounted separately on either side of the rim. When pulling the brake lever, both arms are connected via the cable, and then pads touch the rim.

Check whether the brake pads are perfectly aligned with the rims **(b)** and still sufficiently thick. You can judge the wear of the brake pads by the appearance of the grooves. If the pads are worn down to the bottom of the grooves, it is time to replace them.

The brake pads should hit the rim simultaneously, both first touching it with the front portion of their surface. At the moment of first contact the rear portion of the pads should be a millimetre away from the rim. Viewed from the top the brake pads form a “V” with the trough pointing to the front. This V-shaped setting prevents screeching when the brakes are applied. To align the brake pads, release the fixing bolt, realign the pad and retighten the fixing bolt **(c)**.

The brake lever must always remain clear of the handlebars. You should not be able to pull it all the way to the handlebars, even in the event of an emergency stop.

A correctly adjusted brake will match all these points.



*Adjusting the position of the brake pads relative to the rims requires a considerable degree of skill. Replacing and adjusting the brake pads is a job best left to your FELT dealer.*

## Adjustment

The brake cable of U-brakes with a rotor system installed is composed of several sections, all of which must be checked and adjusted. First of all, release the counter nut on the callipers adjusting devices; then unscrew the adjusting bolt until the cable tension meets your requirements. Finish by keeping the bolt stationary, while tightening the counter nut against the limit stop. The brake only works properly, when all sections are adjusted accurately – a job for a skilled mechanic.

## Lever adjustability

To adjust the brakes at the lever, release the knurled lock ring located at the point where the brake cable enters the brake lever on the handlebars. Release the knurled, slotted adjusting bolt by a couple of turns **(d)**. In this way you shorten the free travel of the brake lever. Keeping the adjusting bolt fixed, tighten the lock ring against the brake lever mount. This prevents the adjusting bolt from coming loose.

Ensure that the slot of the bolt faces neither forward nor upward, as this would permit water or dirt to enter.



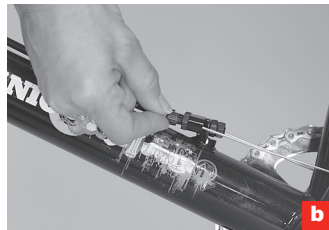
## Adjustment at the brake pads and bowden cables

Another possible means of adjusting the brake is by means of an adjusting bolt located at the front brake **(a)**. Release the knurled nut of the bolt through which the cable passes, unscrew the adjusting bolt by a few turns and finish by retightening the knurled nut relative to the brake arm.

The adjustment of the rear brake can be performed in the same way. In addition, the rear brake cable which is running along the downside of the frame tube can be adjusted by means of another adjusting bolt. Release the counter nut at the cable holder and unscrew the adjusting bolt by a few turns **(b)**. Then retighten the counter nut in order to avoid the bolt coming loose.



**Always test the brakes in a stationary position after adjusting them, making sure that the brake pads engage fully with the rim when you pull them hard.**



## Adjustment of the rear brake at the rotor system

The rotor isolates the brake cables from the handlebar's angle of turn. It allows the handlebar to be turned all the way round whilst providing full braking power at the same time. For this reason much more attention must be paid to the adjustment of the rear brake. When the brake pads wear down, readjust the brake by means of the adjuster at the brake lever as well as at the adjuster in the lower frame area, as described above.

There are two adjusting bolts respectively with counter nuts located directly above and underneath the rotor **(c)**. These adjusting devices allow for synchronization of the pairs of brake cables, so that the rotor moves uniformly and does not get jammed when pulling the lever.



**Working on the rotor and the brake cable parts of the bike are best left to a skilled mechanic. Maladjustment can lead to a failure of the brakes!**

Following the stationary test, check the brakes in a place clear of traffic.

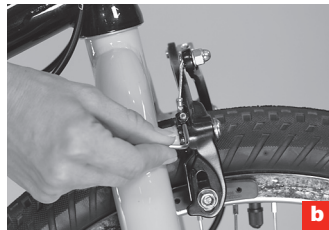


## Synchronization

Some U-brakes are equipped with two bolts for the adjustment of the brake's initial spring tension. These are located on the axle on which the brake arms pivot around and are fixed to the frame. Hold the outer sleeve nut with a spanner in its original position and loosen the inner Allen bolt **(a)**.

Continue by carefully adjusting the outer adjustment nut with the spanner until the distance between brake pads and rim is the same on either side. Retighten the inner Allen bolt, when both pads are in the correct position. Do not exceed the recommended torque.

There are U-brakes of other designs which have a bolt located next to one or both brake pad for the adjustment of the initial spring tension. Adjust this bolt carefully **(b)** until the distance between brake pads and rim is the same on either side.



## Back-pedalling brake (coaster brake)

Except from some cruiser and children's bikes, this type of brake is hardly used any more. The brake mechanism is fully enclosed and it is combined with a geared hub **(c)**.

The back-pedalling brake is actuated by pedalling backwards. For maximum braking power, step on one of the pedals in its rearmost position, with the cranks horizontal.

If your bike has a back-pedalling brake you should occasionally check the tension of the chain. The amount of play, midway between chainring and sprocket, should not be more than two centimetres.

Check regularly whether the coaster brake bracket is still firmly attached to the frame or fork **(d)**.



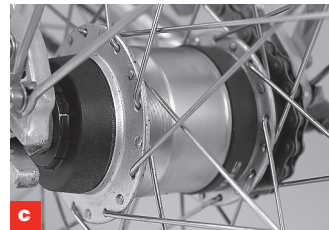
**Back-pedalling brakes get hot in use! Do not touch the brakes, especially shortly after stopping, especially after long downhill rides.**

For more information on your brake model, visit the websites of the respective manufacturers, e.g.:

[www.shimano.com](http://www.shimano.com)

[www.sram.com](http://www.sram.com)

[www.tekro.com](http://www.tekro.com)



## Drum or roller brakes

With these brake systems the brake pads and surfaces are largely protected against the influences of the weather. The braking power is transmitted through cables from the levers to the brakes.

### Checking and adjusting

Regularly check whether you get a positive braking response before the lever touches the handlebars **(a)**.

To a certain extent, wear of the brake pads can be compensated for directly at the brake lever. Unscrew the lock nut on the bolt through which the cable enters the lever and then unscrew the bolt until the lever has the desired travel **(b)**.

Tighten the lock nut again, taking care that the slit of the bolt head does not face upward or forward **(c)**, as this could allow for an unnecessary lot of water or dirt to enter.

After this, check the function and make sure the brake pads do not drag and the wheel turns easily.

Be aware that the point at which braking occurs in the lever's travel could be changed after having made some adjustments. It can reduce the braking power to an extent which will not suffice in extreme braking situations.



Some models offer further adjusting possibilities directly at the brake. In any case, be sure to read the original instructions of the brake manufacturer before adjusting the brakes. If in doubt, ask your FELT dealer for advice.

Check regularly whether the brake bracket is still firmly attached to the frame **(d)** or fork.



**Damaged cables should be replaced immediately, as they can snap. Brakes that have been adjusted at the brake lever only can lose their braking power.**



**Enclosed brake systems are highly susceptible to overheating. It occurs during prolonged braking on long and steep downhill roads or paths. As a result the braking power may be reduced (fading) with a complete failure of the brake in extreme situations. As soon as you feel a reduction in braking power, you should allow for the brakes to cool down. Sometimes, operating the front and rear brake in a alternating pattern can help. If this is not enough, you must stop and wait a few minutes for the brake systems to cool.**



**Drum brakes become very hot during riding. Do not touch the brakes shortly after stopping, especially after a long downhill ride.**

## Disc brakes

Disc brakes **(a)** are distinguished by their formidable braking power and good weather resistance. They respond a lot faster in wet conditions than rim brakes do and produce their normal high power within a very short time. They also require fairly little maintenance and do not wear down the rims as rim brakes do.

One drawback of disc brakes is that they tend to be noisy when they are wet.



*New brake pads have to be bedded in before they reach their optimal braking performance. Accelerate the bike 30 to 50 times to around 30 km/h and bring it to a halt each time. This procedure is finished, when the force required at the lever for braking has stopped decreasing.*

The brake levers can be adjusted to the size of your hands, allowing you to operate them with optimal effectiveness. In most cases this is done by means of a small Allen bolt located directly at the brake lever **(b)**. Note that you may also have to readjust the brake pads when you do this. Please read the manual of the brake manufacturer.



With mechanical disc brakes, the travel of the brake lever becomes longer as the brake pad wears down, making it necessary to readjust the brakes regularly. If you should be in doubt, ask your FELT dealer for advice.



*Manufacturers of hydraulic and mechanical disc brakes deliver their products with detailed instructions. Be sure to read them carefully before removing wheels or doing any maintenance.*



*Disc brakes get hot while using! Do not touch the brakes shortly after stopping, especially after a long downhill ride.*



*Do not open the brake lines. Brake fluid, that can be very damaging to your health, the frame or paint, could leak out.*



*Ensure that braking discs and surfaces are absolutely free of wax, grease and oil.*

For more information on your brake model, visit the website of the respective manufacturer, e.g.:

[www.shimano.com](http://www.shimano.com)  
[www.sram.com](http://www.sram.com)  
[www.tekro.com](http://www.tekro.com)

## Checking hydraulic disc brakes

Regularly check the lines and connections for leaks while pulling on the lever. If brake fluid leaks out, contact your FELT dealer immediately, as a leak can render your brakes useless.

Check the pads for wear by inspecting the thickness of the braking material attached to the backing plate within the brake calliper **(a)** or view through the window on the upper side of the calliper **(b)**. If there is approximately 1mm of material left on each brake pad you will have to remove the pads according to the manufacturer's instructions and carefully remove and replace them.



**Dirty brake pads and discs can lead to drastically reduced braking power. See to it that oil or other fluids do not get in contact with the brake, especially when you clean or grease your bike. Dirty brake pads can under no circumstances be cleaned again, they must be replaced! Discs can be cleaned with warm water and mild soap. There are also special brake cleaners available. Ask your FELT dealer for advice.**



**Loose connections and leaky brake lines drastically impair braking power. If you find leaks in the brake system or buckled lines, contact your FELT dealer.**



## Checking and adjusting mechanical disc brakes

Regularly check whether you get a clearcut braking response before the lever touches the handlebars **(picture (a), page 36)**.

To a certain extent, wear of the brake pads can be compensated for directly at the hand lever. Unscrew the union nut on the bolt through which the cable enters the lever and then unscrew the bolt until the levers has the desired travel **(picture (b) page 36)**.

Retighten the lock nut and take care that the slot of the bolt faces neither forward nor upwards, as this would permit water or dirt to enter **(picture (c) page 36)**.

Now check the functioning of the brake and see to it that the brake pads do not drag on the disc when you release the brake lever and let the wheel spin.

When altering the brake lever adjuster, the arm on the brake calliper changes its position. This can reduce braking power, possibly rendering them useless in an emergency!

There are also ways of adjusting the brakes directly at the brake calliper, though this requires a certain amount of skill. In any case, be sure to read the original instructions of the brake manufacturer before adjusting the brakes. If in doubt, ask your FELT dealer for advice.



**Damaged cables should be replaced immediately, as they can snap. Brakes that have only been adjusted at the brake lever can drastically lose effectiveness.**

## The gears

The gears on your bike serve to adjust your pedalling power to the respective surroundings, wind conditions, and the desired speed. A low gear (where in the case of derailleur gears the chain runs on the small chainring at the front and a large sprocket at the rear) allows you to climb steep hills with moderate pedalling force, but you also have to pedal relatively fast.

High gears (large chainring at the front, small sprocket at the rear) are for riding downhill. Every turn of the pedals takes you many meters forward at correspondingly high speed.

On level ground, your pedalling speed, also referred to as cadence, should be higher than 60 strokes a minute. Racing cyclists pedal at a rate between 90 and 110 strokes a minute on level ground. When climbing uphill, your cadence will naturally fall off somewhat. Your pedalling should always remain fluid however.

There are two types of gears in general use: The derailleur **(a)** and the multi-speed hubs **(b)**.

For more information on operating, inspection and maintenance see the chapter on your type of gears.

For more information on your gears model, visit the website of the respective manufacturer:

[www.paul-lange.com](http://www.paul-lange.com)/[www.sram.com](http://www.sram.com)/[www.campagnolo.com](http://www.campagnolo.com)/[www.shimano.com](http://www.shimano.com)



## Derailleur gears

Derailleur gears are currently the most effective types of transmission for bicycles. With specially designed sprocket teeth, flexible chains and indexed lever positions, gear shifting has become very easy. Most systems nowadays have an indicator on the handlebars showing the currently used gear.

Modern bikes can have up to 30 gears. Using gears which involve an extremely oblique run of the chain reduces power transmission efficiency and hastens wear of the chain. An unfavourable run of the chain is when the smallest chainring (front gearwheel) is being used with one of the two or three outermost (smallest) sprockets (rear gearwheels) or when the largest chainring is being used with one of the innermost (largest) sprockets.



**Always wear straight-cut trousers or use trouser clips or the like to make sure your trousers do not get caught in the chain or chainrings.**

## Derailleur gears – how they work

Derailleur gears always work according to the following principle.

- |                       |                      |
|-----------------------|----------------------|
| Large front chainring | - higher/harder gear |
|                       | - big transmission   |
| Small front chainring | - lower/easier gear  |
|                       | - small transmission |
| Large rear sprockets  | - lower/easier gear  |
|                       | - small transmission |
| Small rear sprockets  | - higher/harder gear |
|                       | - big transmission   |

Normally the shifters are mounted according to the following scheme:

- |               |                                  |
|---------------|----------------------------------|
| Right shifter | - rear sprockets (gear wheels)   |
| Left shifter  | - front chainrings (gear wheels) |



## Deraillieur gears – how they work and how to use them

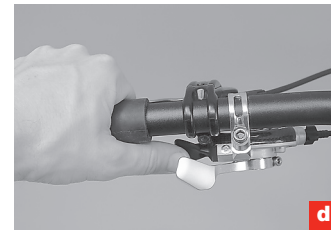
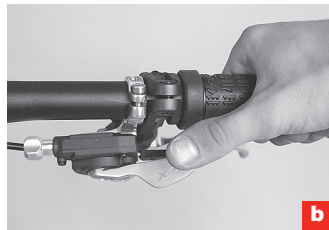
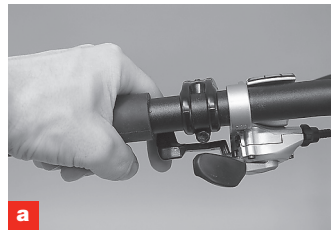
### *Mountain bike gear lever*

Gear shifting is initiated by operating a lever on the shifter, a combined brake and gear lever unit or by a short turn of the wrist with the twist grip, as the case may be.

Because of the variety of different products, your FELT bike can be equipped with components which are different in their shifting directions. Ask your FELT dealer and check this before you ride. Read the manual of the shifting component manufacturer and practise shifting gears until you are familiar with it.

With **Shimano Rapid Fire shifters (a)** (lever shifters) pressing the large shifter lever moves the chain towards the larger chainrings. Pulling the small lever towards the back of the bike, located in front of the handlebars from the rider's viewpoint, shifts the chain towards the smaller sprockets.

This means that any gear shift made by pushing the large thumb shifter on the right produces a lower gear, while pressing the large thumb shifter on the left moves the chain to the larger chainring, thus producing a higher gear.



The **Shimano Rapid Fire Plus shifters (b)** (e.g. XTR model 2007) work according to the usual Rapid Fire principle (see above), but in addition the small lever (the index finger lever) can be pushed forwards with the thumb to achieve the same shifting action as when using the index finger. The chain runs to the small chainring and sprockets.

So you can shift by thumb and index finger or use the thumb only.

Furthermore, you can shift several gears with one action: A short pull or press of the shifter lever results in a single gear change, a long pull or press leads to multiple gear shifts.

With the **Shimano Dual Control gear and brake lever components (c)**, the brake lever has to be pushed downward to shift to the smaller sprockets at the rear or to shift to the bigger chainring at the front. This will give you a higher gear.

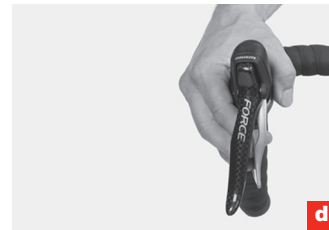
Pushing the brake lever upward or pushing the optional small lever, located under the handlebar, with the thumb, will give you a bigger sprocket at the rear or a smaller chainring at the front, both leading to a lower gear.

Pressing the large shifter lever of **SRAM trigger shifters** (picture **(d)** page 40) located under the handlebar with your thumb, shifts the chain to the bigger chainrings at the front or larger sprockets at the rear. The smaller shifter, located under the handlebar as well, but higher than the big one, is pushed with the thumb, too, and moves the chain to move to the smaller chainrings or smaller sprockets.

The principle of **SRAM twist grips** is slightly different **(a)**. Twisting the right-hand grip towards you moves the chain to a larger sprocket giving you a lower gear, while the same movement on the left produces a higher gear by moving the chain to the larger chainrings.


**a**

**b**

**c**

**d**

### *Road bike gear lever*

On road bikes the gear levers are integrated with the brake lever.

On a **Campagnolo Ergopower** **(b)** equipped bike, moving the small gear lever located behind the brake lever inward with your index or middle finger shifts the chain towards the larger sprockets. Pressing with your thumb on the shifter located on the inward facing side of the brake lever mount, moves the chain towards the next smaller sprocket. A maximum of three sprockets can be shifted per move.

With **Shimano Dual Control levers** **(c)** swivelling the entire brake lever inward shifts the chain towards the larger sprockets. Up to three sprockets can be shifted per tap. Moving the small lever alone shifts towards the smaller sprockets, but only one per tap.

**SRAM Force Doubletap levers** **(d)** have only one shifting lever positioned behind the brake lever. A short tap to the inward moves the chain to a smaller sprocket. Sweeping the shifting lever further in, makes the derailleur shift the chain to larger sprockets. One tap can shift up to three gears.

### Bar end gear lever

With **Shimano and SRAM bar end shifters (a)** for triathlon and time trial use the shifter is pressed downwards to move the chain to the smaller sprockets in the rear, i.e. to achieve a higher gear, and to the smaller chainrings in the front, i.e. to achieve a lower gear. By pulling the shifter upwards the chain can be moved to the bigger sprockets and chainrings.

It is always important when shifting gears to continue pedalling smoothly without force whilst the chain is moving between sprockets or chainrings! Shifting gears under load, i.e. while pedalling hard, can cause the chain to slip and considerably shorten its service life.



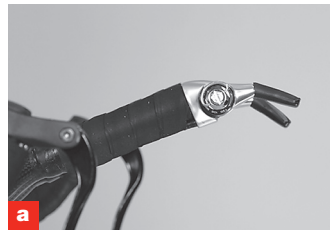
**Shifting under load with the front derailleur can cause the chain to fall off the chainwheels; this can lead to an accident! At least the durability of the chain will be shortened considerably.**



**Practise shifting gears in a place clear of traffic until you are familiar with the functioning of the levers or twist grips of your FELT bike.**



**Avoid gears which involve an extremely oblique run of the chain.**



### Special features of cruiser bike gear shifting

FELT cruiser bikes can be used with various types of gear levers.

With the **twist grip shifters (b)**, a gear change is achieved by twisting the grip by the flick of the wrist; the shifting direction may vary, according to the shifter version. You can continue pedalling, without load on the pedals, while shifting gears, or you have to free-wheel.



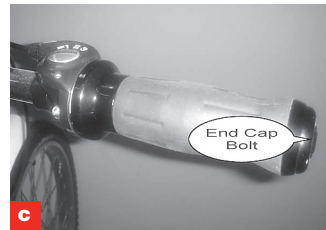
**The 3-speed cruiser shifter/grip, as shown below (c), is fixed to the handlebar by means of the end cap bolt. The handlebar end plug must be installed correctly (complete insertion into the handlebar), and tightened securely (12 Nm torque) for it to work properly.**

**Check the connection before each ride in order to make sure the gear lever sits firmly on the handlebar and the plug is fixed tightly and securely to the handlebar.**



**If you have any questions regarding operation and maintenance of your gear, please contact your FELT dealer.**

With the system of the **frame-mounted shifting levers** a change of the gear is achieved by moving the levers upwards or downwards. One shifting lever actuates the front derailleur; another one actuates the rear gear changer. If you are unsure about the operation, practise changing gears in a place free of traffic.



## Checking and adjusting derailleur gears

The derailleur gears **(a)** of your FELT bike were carefully adjusted by your FELT dealer before delivery. However, Bowden cables may stretch a little during the first kilometres of use, making gear-changing imprecise. This will result in the chain not wanting to climb onto the next larger sprocket.

### Rear gear changer (rear derailleur)

Increase the tension of the Bowden cable by turning the adjusting bolt through which it passes at the entry to the shift lever or gear changer **(b)**. To do so, shift to the smallest sprocket and turn the adjustment bolt anticlockwise in half turns until the cable is tensioned.

After tensioning the Bowden cable check whether the chain immediately climbs onto the next larger sprocket. To find out, you either have to turn the cranks by hand or ride the bike and change gears.

If the chain easily climbs onto the next larger sprocket, check whether it just as easily shifts to the small sprockets when you change to a higher gear. You may need several tries to get the derailleur system properly adjusted.



## Adjusting the limit stops

The rear derailleur is equipped with limit screws which limit the movement range of the derailleur, thus preventing the derailleur and chain from colliding with the spokes or the chain from dropping off the smallest sprocket towards the seat stay. The limit screws have been adjusted by your FELT dealer. They do not alter their position during normal use. After an accident or replacement of the rear wheel, the correct position must, however, be checked.



*If your bike tips over or the rear derailleur gets a blow, the rear derailleur or its mount can get bent. It is advisable to check its range of movement and readjust the limit screws if necessary after such an incident or after mounting new wheels on your FELT bike.*

Shift the right gear lever to the highest gear (smallest sprocket). Now the inner cable is totally relaxed and the chain is automatically running on the smallest sprocket **(c)**. Look from the rear of the bike at the cassette and check whether the teeth of the smallest sprocket, the chain passing through the rear derailleur and the teeth of the pulleys in the derailleur are all in a perfectly vertical line.

The limit screws on gear changers are often marked “H” for high gear and “L” for low gear. If necessary, correct the resting position of the derailleur to make everything vertically aligned by means of the “H” limit screw **(d)**. In this case high gear stands for high transmission ratio, i.e. with the chain running on the smallest sprocket.



If the screws are not marked, you will have to find out by trial and error. Turn one of the screws, counting the number of turns, and watch the derailleur **(a)**. If it does not move, you are turning the wrong one. Turn back the counted rotations to find its original position.

Then try the same procedure with the derailleur shifted to the lowest gear (largest sprocket). Turn the “L” limit screw clockwise to shift the derailleur away from the wheel and anticlockwise to shift it towards the wheel.

Once the limit screws are checked and set, change up and down through the gears **(b)**. When the chain runs on the largest sprocket see whether you can shift the gear changer even further by moving the gear lever to the end of its travel. Then press the gear changer further towards the spokes by hand **(c)**. Spin the wheel. If the derailleur cage moves towards the spokes or if the chain begins to move beyond the largest sprocket, the limit screw marked “L” requires further adjustment until the gear changer is clear of the spokes.



**Adjusting the front and rear derailleurs is a job which must be carried out by an experienced mechanic unless you are entirely comfortable in doing so. If you want to do this yourself, be sure to read the operating instructions of the gear manufacturer. If your gears give you any trouble, please ask your FELT dealer for advice.**



**Always go on a test ride in a place free of traffic, after adjusting the gears of your bike.**



a



b



**Always check after an accident whether the front derailleur is still parallel to the chainring, and the rear derailleur is parallel to the sprockets of the cassette.**



**Adjusting the front gear changer is a delicate job. Improper adjustment can cause the chain to jump off, thus interrupting the power train. This can cause an accident!**



**Always go on a test ride in a place free of traffic, after adjusting the gears of your bike.**



c



d

### Front gear changer (front derailleur)

Adjusting the swivelling range of the front derailleur requires a great deal of experience. The range within which the front derailleur keeps the chain on the chainring without itself touching the chain is very small. It is often better to let the chain drag slightly on the derailleur than to risk having the chain fall off the chainring, which would interrupt the power train. If the chain tends to jump off the chainring, you will need to reduce the swivelling range in the same way as with the rear derailleur, i.e. by turning the limit screws marked “H” and “L” **(d)**. It is advisable to let your FELT dealer do that job.

As with the rear derailleur, the cable of the front derailleur is subject to stretching during initial usage and hence to reduced precision in gear changing. If necessary, shift to the small chainring and increase the tension of the bowden cable by turning the adjusting bolt through which it passes at the entry to the gear shifter or at the frame in the down tube area on a road bike.

## Multi-speed hubs – internal gear hubs

Two advantages of multi-speed hubs are their enclosed design and the fact that you can switch up to 14 gears from one gear to the next all on the same lever. Besides this, the chain lasts a lot longer than with derailleur gears, provided it is serviced regularly.

Multi-speed or so called internal gear hubs from **Shimano (a)** are available with a free-wheel or with an integrated back pedal brake. The free-wheel hub is normally combined with a hand activated V- or roller brake, or with an integrated rear brake. The integrated back pedal brake is activated by pedalling backwards. The best braking power is achieved with the pedals on a horizontal level.

Multi speed hubs from **SRAM (b)** are available with a free-wheel or with integrated back pedal brake. The free-wheel hub is normally combined with a hand activated V-brake or with an integrated coaster brake, the so-called back-pedalling brake. The integrated back-pedalling brake is activated by pedalling backwards. The best braking power is achieved with the pedals on a horizontal level and in low gears.

## How they work and how to use them

Internal gear hubs are equipped with a shift lever or thumb switch for changing gears as well as with an indicator showing the current gear. Depending on the type of hub, you can continue pedalling without load on the pedals while shifting gears, or you have to free-wheel. For more information read the operating instructions for your gears or ask your FELT dealer. In any case, make sure changing gears makes as little noise as possible.



Twist grips from **SRAM (d)**: to change gears, twist the grip, stop pedalling for a moment and do not move the pedals.

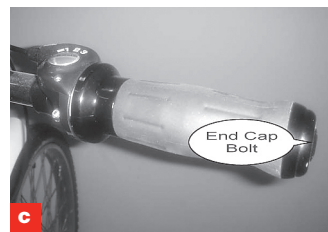
Twist grips of a **Shimano Nexus (e)** hub: shifting gears is better during pedalling. But for noiseless gear changing, you have to reduce the power through the pedals.



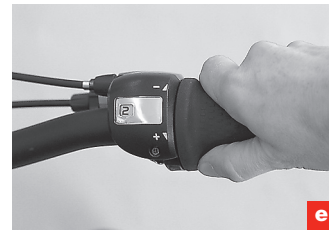
*Practise shifting gears in a place clear of traffic.*



*With FELT 3-speed cruiser shifter/grip (c) the handlebar grip is also the shifting mechanism. This grip/shifter is fixed at the handlebar by the handlebar end plug. The handlebar end plug must be installed correctly (complete insertion into the handlebar), and tightened securely (12 Nm torque) for it to work properly.*



*As with all bicycle component hardware, check this bolt at the point of first assembly, as well as regular checking by the customer before each ride is recommended to ensure the plug is tight and secure to the handlebar.*





## Adjustment

Multi-speed hubs need not be adjusted very often. The adjusting mechanisms are located at the hubs **(a)** or at the shifting lever. There are two (red) marks on the hub which have to be brought into alignment by adjusting the cable.

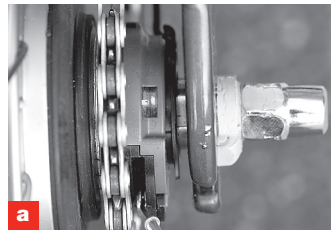
Read the operating instructions of the gear manufacturer carefully. If you have any questions, your FELT dealer will be pleased to help you.



**Check regularly whether the hub or coaster brake bracket is still firmly connected to the frame.**

## Checking the chain tension

In the case of multi-speed or single-speed hubs, e.g. BMX, which are not equipped with a chain tensioner with spring preload, the drive chain tension must be checked occasionally, i.e. every 1,000 km, depending on the intensity of use. The amount of play midway between chainring and sprocket should not be more than two centimetres **(b)**.



a



b



c



d

## Adjusting the chain tension of bikes with adjustable drop outs

For the adjustment of the chain tension you need to release the rear wheel axle bolts or nuts **(c)**. The bolt of the coaster brake bracket must be released by two turns, as well.

Then pull the rear wheel to the rear, tighten the chain with the bolts or nuts intended for this purpose **(d)** and screw tight again the rear wheel axle on both sides. Check the chain tension. The amount of vertical play midway between the chainring and sprocket should not be more than two centimetres.

After the adjustment of the chain tension, finish by tightening the rear wheel axle bolts with a torque wrench.

Tighten the bolt of the coaster brake bracket to the stipulated torque.



## Chain maintenance

Regular and correct lubrication of your bicycles chain makes for enjoyable riding and prolongs its service life. It is not the quantity; rather the distribution and regular application of lubricant that counts.

Clean the dirt and oil off your chain with an oily rag from time to time. Special degreasers are not a necessity but can help speed up the job and remove built up dirt more completely. Having cleaned the chain as thoroughly as possible, apply high quality chain oil, wax or grease to the chain links **(a)**.

To lubricate the chain, drip the lubricant onto the rollers of the lower run of the chain whilst you turn the cranks. Once this is done, turn the cranks a few more times then let the chain rest for a few minutes so that the lubricant can disperse.

Finally wipe off excess lubricant with a rag **(a)** so that it does not spatter around during riding or can collect road dirt.



**For the sake of the environment, try to only use biodegradable lubricants. Bear in mind that some of the lubricants can end up on the ground.**



**Make sure the braking surfaces of the rims and disc brakes remain clear of lubricants, as the brakes will fail otherwise!**


**a**

**b**

## Chain wear

Although the chain is one of the parts of a bike that wears and stretches in use, there are still ways of prolonging its service life. Make sure the chain is lubricated regularly, but not excessively, especially after riding in the rain. Try only to use gears which run the chain in the straightest line between the sprockets and chainrings. Get in the habit of high cadence pedalling.

Dependent on usage, weather conditions and maintenance you will get approximately 1,000 to 3,000 km of use from your bicycles chain. Heavily worn or stretched chains impair the operation of derailleur gears. Cycling with a worn-out chain also accelerates the wear of the sprockets and chainrings. Replacing these components is relatively expensive compared with the costs of a new chain. It is therefore advisable to check the condition of the chain at regular intervals.

To check chain wear, run the chain on the largest chainring. Take the chain between your thumb and index finger and try to lift it off the teeth. If you can lift it off, clearly exposing more than two of the gaps between the chainrings teeth then it is stretched and probably at the end of its useful life and should be replaced.

Your FELT dealer has accurate measuring instruments for precise chain inspection **(b)**. Replacing the chain should ideally be left to an expert because not all chains have a master link nowadays. Instead they have a continuous design and require special tools for fitting. If you need help, ask your FELT dealer to select and fit a chain matching your gear system.



**An improperly joined or heavily worn chain can break and may cause an accident.**



**It is advisable to only replace your chain with one identical to that which was originally fitted. An unsuitable chain may lead to a reduced precision in gear changing and may make the chain slip temporarily, possibly resulting in an accident.**

## The wheels and tires

The wheel **(a)** consists of the hub, the spokes and the rim. The tire is mounted onto the rim so that it encases the tube. There is a rim tape running around the trough of the rim to protect the sensitive tube against the spoke nipples and the edges of the rim trough, which are often sharp.

The wheels are subject to considerable stress through the weight of the rider and any carried baggage as well as through bumpy road surfaces and terrain. Although wheels are manufactured with great care and delivered accurately trued, this does not prevent the spokes and nipples from losing a little tension on the first kilometres. Ask your FELT dealer to true up the wheels after you have bedded them in over around 100 to 300 kilometres.

Check the wheels regularly, especially after bedding them in. It will rarely be necessary to tighten the spokes.



*If you mount a wheel set with carbon rims onto your road or triathlon bike, bear in mind that you might have to mount special brake pads as well. Typical brake pads for aluminium rims probably will not perform at the level needed for a safe ride! Take note of the wheel set manufacturer's user manual.*



*If you mount a wheel set with tubular tires onto your FELT bike, you should be familiar with the handling of this particular type of tire. Read the user manual of the wheel/tire manufacturer. Take note that the rim diameter is a little bigger than that of clincher tires which has to be considered when adjusting the position of the brake pads. The information given in the following only refers to wired-on and clincher tires which are used most commonly.*



## Tires, tubes, rim tape, valves, inflation pressure

The tires provide the friction needed for carrying the bike forward on the riding surface. At the same time they should grant minimum rolling friction and enhance the rider's comfort by absorbing small shocks. The suitability of a tire for road surfaces or cross-country cycling is determined by its inner structure, also referred to as its carcass, as well as by the type of tire profile. Your FELT dealer will be pleased to help you choose from the numerous types available for various cycling purposes.

If you want to replace a tire, you need to know the dimensions of the old tire. These are written on the side of the tire **(a)**. There are two designations, the more precise of which uses millimetres. The number sequence 23-622 means that the tire is 23 mm wide when fully inflated and has an inner diameter of 622 millimetres. The other designation for this tire reads 28 x 7/8 which refers to inches.



**Mounting a new tire with other dimensions might possibly cause the tip of your shoe to touch the wheel whilst steering, or the mudguards getting caught in the tire. In both cases, there is the danger of an accident!**



a



ab



ab



ab

The tire and rim alone are not able to hold the air. Therefore, an inner tube has to be placed inside the tire to retain the air pressure. The tube is pumped up via a valve

Tires have to be inflated to the correct air pressure in order to work properly. Properly inflated tires are also more resistant to punctures. An insufficiently inflated tire can easily get pinched ("snake-bite") when it goes over a sharp curb.

The air pressure recommended by the manufacturer is given on the side of the tire or on the type label **(b)**. The lower of the two pressure specifications makes for better cushioning and is therefore best for off-road cycling. Rolling resistance decreases with growing pressure, but so does comfort. A high tire pressure is therefore most suitable for riding on tared roads.

Heavy riders should always see to it that they ride on highly inflated tires, without exceeding the permitted tire pressure.

Tires allowing an inflation pressure of five bars or more have to be mounted on hook bead rims, identifiable by the designation "C". Ask your FELT dealer to advise you.

An exception to this is the tubeless systems for mountain bikes. In this case, the rim and tire hold the air without a tube.



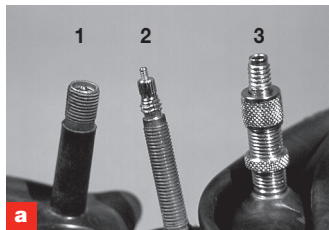
***If your bike is equipped with tubeless tires, please read the manual of the wheel/tire manufacturers, before using them.***

Inflation pressure is often given in the old system of units, i.e. in psi (pounds per square inch). The table gives the most common pressure values in terms of both systems.

psi	Bar	psi	Bar	psi	Bar
30	2.1	70	4.8	110	7.6
40	2.8	80	5.5	120	8.3
50	3.5	90	6.2	130	9.0
60	4.1	100	6.9	140	9.7



***Treat your tires well, in particular avoid sharp edges where possible. Never inflate your tires beyond the maximum permissible pressure, they might burst or come off the rim during a ride, this can lead to an accident!***



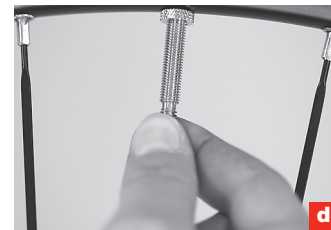
There are three valve types **(a)** in general use on FELT bikes:

- 1 Schrader or car valve: This is an adapted car tire valve which is mainly used on mountain bikes.
- 2 Presta (road bike) valves: This type is nowadays used on almost all types of bicycles. It is designed to withstand extremely high pressures.
- 3 Dunlop or Woods valve, this is an older and rarely used valve type.

All three valve types come with a plastic cap to protect them from dirt. The car valve and the Dunlop valve can be inflated with a suitable pump directly after removing the protective cap.

With Presta valves, you first have to undo the small knurled nut until it stops **(b)** and depress it carefully until air starts to escape **(c)**. With this valve type it occasionally happens that the knurled nut is not screwed down properly after adjusting the tire pressure, and air can slowly leak out **(d)**. Check the nut is tightened and seated in its stem.

Tires with Schrader valves can conveniently be inflated at car filling stations with a compressed air dispenser.



A compressed air dispenser must only be used very carefully as you may otherwise overinflate the tire and make it burst. To let out air, press the needle in the centre of the valve using, e.g., a spanner/key.

Hand pumps are often unsuitable for inflating tires to high pressures. A better choice is a foot-operated or a track type pump equipped with a pressure gauge which enables you to check the pressure at home.

Your FELT dealer has adapters for all types of valves **(a)** which allow you to inflate any type of tire at the filling station.



**Always ride your bike with the prescribed tire pressure and check the pressure at regular intervals.**

Replace tires with a worn tread or with brittle or frayed sides. Dampness and dirt penetrating the tire can cause damage to its inner structure.



**Replace spoilt rim tapes immediately.**



a



b

## Rim trueness, spoke tension

The tension exerted by the spokes has to be distributed evenly around the rim in order for the wheel to run true. If the tension of a single spoke changes, e.g. as a result of riding fast over a curb or of spoke breakage, the tensile forces acting on the rim become unbalanced and the wheel will no longer run true.

The functioning of your FELT bike may even be impaired before you notice the wobbling appearance of a wheel that has gone out of true.

With calliper brakes, the sides of the rims also serve as braking surfaces. An untrue wheel can impair your braking power.



**Do not ride with untrue wheels. In the case of extreme side-to-side wobbles, the brake pads can miss the rim and get caught in the spokes! This normally instantly jams the wheel. High danger of crash!**

It is therefore advisable to check the wheels for trueness from time to time. For this purpose lift the wheel (whilst still in the bike) off the ground and spin it with your hand. Watch the gap between the rim and the brake pads. In the case of wheels with disc brakes hold plastic tire lever (for example) close to the rim. If the gap between the tip of the lever and the rim varies by more than a millimetre, you should ask an expert to true up the wheel.

Check the spoke tension as well. Hold one pair of spokes after the other and press them slightly together **(b)**.



**Loose spokes must be tightened at once. Otherwise the load on the other spokes and the rim will increase.**



**Truing wheels is a difficult job which you should definitely leave to your FELT dealer.**

## Wheel fastening: wheel nuts or quick-releases

The wheels are attached to the frame at the hub axles. Each axle is clamped tight in its drop-outs by means of hexagon nuts or a quick-release. Furthermore, there are thru axle wheels for mountain bikes.



**Never ride a bike without having checked first whether the wheels are securely fastened. A wheel that comes loose whilst riding is very likely to cause an accident!**

**Wheel nuts (a)** usually require a 15 mm spanner for tightening or loosening (some BMX bikes require a 15 mm socket wrench). This tool is a must on any bike ride, as you can have a lot of trouble repairing a puncture without it.

A special feature of BMX bikes is the **axle pegs (b)**. When removing the wheels, e.g. in the event of a puncture, the pegs must be removed as well. The axle pegs are often threaded. Sometimes they are in place of the wheel nuts. Unscrew these axle pegs with a spanner. Another type of axle pegs is bolted between the drop-outs and the wheel nut. They are loosened automatically by unscrewing the wheel nuts.



**Quick-releases (c)** require no tools at all. Just release the lever, unscrew it a few turns if necessary and take out the wheel (See chapter “How to use the quick-releases”).

The only drawback is that a thief will find this just as easy to do!

There are special locks available which you can use instead of quick-release levers. For these, you need a specially coded key or an Allen key.



**If your bike is equipped with quick-releases, be sure to lock it to an immovable object together with the wheels when you leave it outside.**

The front wheel is usually secured additionally by means of drop-out safety tabs which prevent the wheel from coming off altogether if the quick-release comes loose.

There are different types of **thru axle systems (d)**. Also read the chapter “Notes on the mounting of thru axle wheels”.

If you are in doubt, ask your FELT dealer to show you how to handle the thru axles.





## Repairing punctures

Tire punctures can happen to any cyclist. Flat tires are by far the most common mishap during cycling.

As long as you have the necessary tools for changing tires and tubes and a spare tube or a repair kit, this need not be the end of your cycle ride. For bikes with quick-releases all you need in addition are two tire levers and a pump.

## Dismounting wheels

If your bike has **cantilever or V-brakes (a)**, you first have to disengage the brake cable from the brake arm. To do this, grip the brake with one hand and press the brake pads and arms together. In this position, it should be easy to disengage the usually barrel-shaped nipple (with cantilever brakes) or, in the case of V-brakes, the outer cable and guide pipe.

With **road bike brakes (b)** (Shimano & SRAM), first of all open the quick-release on the brake calliper or shift the pin in the combined gear-and-brake-lever mount on the handlebars (Campagnolo).



With **roller and drum brakes** as well as **internal gear hubs (c)**, you have to loosen the brake bracket supporting the drive and braking force on the frame. In addition, with internal gear hubs you have to disconnect the shifting cables and the click box respectively before dismounting the wheel **(d)**.

If you have **disc brakes**, you should first check the condition and position of the brake pads. See the chapter “**Checking hydraulic disc brakes**”.

In this way you will be able to tell that they are functioning correctly and that they will permit removal of the wheel. Read the brake manufacturer’s manual.



*Do not pull on the disc brake lever with its rotor and wheel removed from the bike.*



*Brake discs and drum brakes can become hot in use, so let them cool down before you remove a wheel.*

If you have derailleur gears, you should shift the chain to the smallest sprocket before removing the rear wheel. This shifts the rear gear changer right to the outside where it does not interfere with the removal of the wheel.





Turn the wheel nut anticlockwise or open the quick-release lever as described above. If you cannot remove the wheel after releasing the lever, it is probably still being held in place by drop-out safety tabs. These either come as projections **(a)** which jut into the drop-outs or as metal catches which engage with recesses in the drop-outs. Just release the quick-release adjusting nut by a few turns and slip the wheel past the tabs.

You will find it easier to remove the rear wheel, when you rotate the rear derailleur backwards a little **(b)**.

Lift the bike off the ground and give the wheel a gentle tap with your hand so that it drops out.



*Please have a look at the manual of the brake and the gear manufacturer.*



## Dismounting tires

Remove the valve cap and, if necessary, the fastening nut from the valve and deflate the tire completely **(c)**.

Press the tire from the sides towards the centre of the rim. You will find it easier to remove the tire, if you do this around its entire circumference.

Apply a plastic tire lever to one bead of the tire approx. 5 cm beneath the valve and lever the tire out of the rim in this area. Hold the tire lever tight in its position.

Slip the second tire lever between rim and tire at a distance of about ten centimetres on the other side of the valve and lever the next portion of the bead over the edge of the rim **(d)**.

After levering a part of the tire bead over the edge of the rim you should normally be able to slip off the whole tire on one side by moving the tire lever around the whole circumference.

Now you can pull out the tube. See to it that the valve does not get caught, as this can damage the tube.

If necessary you can remove the whole tire by pulling the other tire bead off the rim.



If required, repair the puncture according to the instructions of the manufacturer of the repair kit or use a new spare tube.



***In the case of high pressure tires, FELT recommends not to repair punctures.***

If you have removed the tire, you should also check the rim tape **(a)**. The tape should lie squarely in the trough of the rim, covering all spoke nipples, and should not be torn anywhere or brittle. In the case of double wall rims – the tape must cover the entire floor of the rim, but it should not be so broad as to stand up along the inside edges of the rim trough. Rim tapes for this type of rim should only be made of textile or durable plastic. Ask your FELT dealer, if you are in doubt about what kind of rim tape to use.



***If you have a puncture whilst riding, do not pull the whole tube out of the tire. Leave the valve sticking through the rim and first look for the hole where the air is escaping. Pump up the tube to make it easier to find. Bring the tube close to your ear and in most cases you can hear the air coming out. A bucket of water could also be helpful. When you have found the hole, look for the corresponding place on the tire and examine it. Often, you will find a foreign body sticking in the tire, which ought to be removed. Otherwise another puncture can occur.***


**a**

**b**

**c**

**d**

## Mounting tires

When mounting a tire make sure no foreign matter, such as dirt or sand, gets inside the tire and you do not damage the tube in the process.



***If your bike is equipped with sew-up tires (tubulars) or tubeless systems, please read the instructions of the tire and tire glue manufacturer before mounting and removing these tires!***

Slip one bead of the tire onto the rim. Using your thumbs, press the bead over the edge of the rim and then around the entire circumference. This should always be possible without using tools, regardless of the type of tire.

Stick the valve of the tube through the hole in the rim **(b)**.

Inflate the tube slightly so that it becomes round and push it into the tire all the way round **(c)**. Make sure not to leave any folds in the tube.

To finish mounting the tire, start at the opposite side of the valve. Using your thumbs, press as much of the second bead of the tire over the edge of the rim as you can. Make sure the tube does not get pinched and squashed between the tire and rim. You can prevent this by pushing the tube into the hollow of the tire with a finger as you work along **(d)**. Work the tire into the rim, approaching the valve symmetrically from both sides.

Towards the end, you will have to pull the tire vigorously downwards to make the already mounted portion of the tire slip towards the deepest part of the rim trough **(a)**. This will ease the job noticeably on the last centimetres.

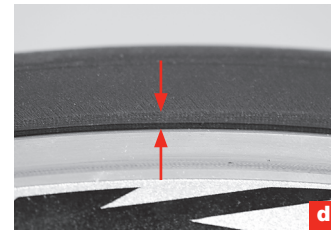
Check again if the tube lies properly inside the tire and press the last stretch of tire over the edge of the rim using the balls of your thumbs.

If this does not work, you will have to use the tire levers. Make sure the blunt ends point towards the tube and that the tube does not get damaged.

Push the valve a little into the tire so that the tube does not get caught between the rim and the tire beads. Does the valve stand upright? If not, dismount one bead again and reposition the tube. To make sure that the tube does not get pinched between rim and bead, inflate the tire a little and then move it sideways back and forth between the sides of the rim **(b)**. While doing so, you can also check whether the rim tape has been displaced.

Inflate the tube to the desired pressure. The maximum pressure is indicated on the side of the tire **(c)**.

Check that the tire is properly seated, orienting yourself by the line on the circumference of the tire just above the edge of the rim **(d)**. The distance between the line and the edge of the rim should be constant around the entire circumference of the tire.



## Mounting wheels

To mount a wheel, follow the reverse procedure of wheel removal. Make sure the wheel is correctly seated in the drop-outs and accurately centred between the legs of the fork or the seat and chain stays.

Make sure the quick-release and the drop-out safety tabs are correctly seated.



*If you have rim brakes, make sure you immediately connect the brake cable again or close the release lever or shift the bolt in the brake lever back to its original position (a)!*

In the case of multi-speed hubs, back pedal, roller or drum brakes, check if all the relevant components are properly mounted (b). Retension the chain before tightening the wheel nuts by pulling the wheel rearwards. You should not be able to move the chain more than two centimetres up and downwards. Under no circumstances should the chain sag!

Remount, if necessary, the axle pegs.



*With drum, roller and back-pedalling brakes, fasten the coaster brake bracket again.*



a



b



c



d

If you have disc brakes, check the brake pads rest snugly in their seats in the brake calliper body. The gap between the pads should be parallel and the wear on each pad equal. Make sure that you guide the rotor between the brake pads carefully (c).

After mounting the wheel and tightening the quick-releases pull the brake lever and spin the wheel. The rotor should not drag on the brake calliper or on the brake pads.



*Before riding again check that you have not let any grease or other lubricants get on the brake pads or disc while mounting the wheel.*



*Check whether the brake pads hit the discs or rims braking surfaces (d). Make sure the wheel is correctly and firmly fixed in the drop-outs. Always do a brake test as described in the chapter "Before every ride"!*

## The headset

The headset connects the fork to the frame, but allows it to move freely. It must afford virtually no resistance to turning if the bike is to run straight, stabilizing itself as it travels. Shocks caused by uneven road surfaces expose the headset to considerable levels of stress. In this way it can become loose and go out of correct adjustment.



*Riding the bike with a loose headset increases the stress on fork and bearings. This can lead to damage to the fork, resulting in very serious consequences!*

### Checking and adjusting

Check the headset for play by placing your fingers around the upper headset cup and the upper bearing cap **(a)**.

Pull the front brake with your other hand and push the bike firmly back and forth with the wheel remaining on the ground. If the bearings have play, you will feel the upper headset cup moving relative to the upper bearing cap – visible as a small gap in between the cup and the cap.



To check if the bearing runs smoothly, lift the frame up until the front wheel no longer touches the ground. Turn the handlebars from the left to the right. The handle bars should turn very easily from far left to far right without feeling roughness or tightness at any point. Turning the bars should require only a very light tap on the grips **(b)**.



*Adjusting the headset requires a certain amount of experience and should therefore be left to your local FELT dealer. If you want to adjust a conventional headset you will need special tools. If you nevertheless want to try adjusting it yourself, please read the operating instructions of the manufacturer carefully before you do!*

## Conventional headset (a)

The adjustment tolerance between there being play in the bearings and them being set too tight is very small. The bearing can easily be damaged. This is a job for a skilled mechanic.

If you want to try it nevertheless, you need two large and flat open-end wrenches.

Release the threaded top nut and tighten the upper threaded bearing cap a little. Retighten the top nut **(b)**.

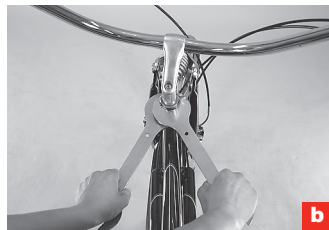
After the adjustment, check the bearing for play and ease of running once again.



*If the headset is adjusted too tight, the performance of the bike will be impaired and the bearings will be damaged.*



*Adjusting the headset requires a certain amount of experience and should ideally be left to your local FELT dealer. If you want to adjust a conventional headset, you will need special tools. If you nevertheless want to try adjusting it yourself, please read the operating instructions of the manufacturer carefully before you do!*



## Threadless headset: "Aheadset"

The special feature of this system is that the stem does not sit within the fork steerer tube, but rather is clamped onto the outside of the fork steerer tube, which in this case is threadless. The stem is an important part of the headset bearing system. Its clamping force secures the bearings in the correct running position.

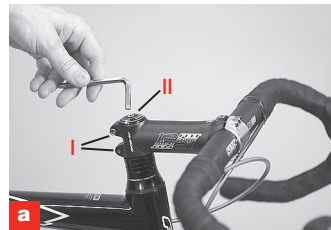
Instead of special tools you need in most cases only Allen keys.

Release the clamping bolts (I) located on the side of the stem by one to two complete turns.

Using an Allen key, gently tighten the countersunk adjusting bolt (II) on top of the stem a little, e.g. by a quarter turn (a).



**Do not over tighten the bolt, it only serves the purpose of adjusting the bearing play, not securing of the stem!**



After adjustment, realign the stem so that the handlebars are in line with the front hub. Check that the front wheel is aligned with the top tube of the frame and the stem (b).

Using a torque wrench, tighten the stem clamping bolts again according to the values given in the enclosed manuals or printed directly on the component (c). You should not be able to turn the stem relative to the fork after tightening the bolts (d).



**Check the stem clamping bolts are securely tightened, after having adjusted the bearings, by holding the front wheel between your knees and trying to twist the handlebars against the front wheel. A loose stem will cause an accident.**



## The suspension fork

The majority of the mountain and hybrid bikes are equipped with suspension forks **(a)**. This feature gives you better control of your bike on rough surfaces. It noticeably reduces the strain on you and your bike caused by the mechanical shocks from the terrain.

Suspension forks differ in their spring elements and in the way the damping is realised. The suspension may be provided by coil springs, special types of plastic known as elastomers or sealed air compartments or combinations of these options. The damping is usually done by oil or by the self-damping properties of the elastomers.

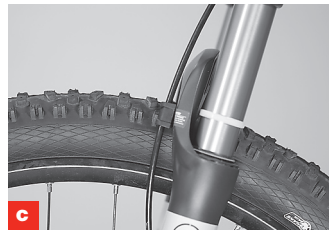
### Adjustment

In order to work optimally, the fork has to be adjusted to the weight of the rider and its intended purpose, even if the springs of your FELT bike are already adjusted to your weight on delivery.



*If you realise that the suspension forks compress totally whilst out riding so that they hit the end of their travel hard, let your FELT dealer adjust it. Otherwise, the fork may become internally damaged.*


**a**

**b**

**c**

**d**

Adjusting the fork to your needs will be easy, if you use a simple trick.

Put a cable tie onto the upper fork tube so that you can still slide it easily along the tubes exposed section **(b)**.

Generally speaking, the fork should compress when you sit on the bike, in order to create sag **(c)**. With cross country and marathon bikes we recommend a sag of approx. 10 - 25 % of the forks total travel, with enduro and freeride bikes a sag of approx. 20 - 40 % of the forks total travel. If this is not the case, you have to change the initial spring tension.

The initial tension of forks with coil springs or elastomer internals can be altered to a limited degree by adjusting the preload knob (if fitted) located on the fork crown.

In the case of oil/air forks, the spring rate is adjusted by the air pressure in the fork. The pressure must be checked at regular intervals with a special shock pump **(d)** which is normally made available by the fork manufacturer. Please follow the recommendations of the manufacturer.

Ride your FELT bike on different kinds of surface and check afterwards to what extent the fork's travel was used. If the cable tie has only moved a few millimetres, your fork is in too firm; reduce the preload (or air pressure). If there is not enough adjustment, the springs will need replacing.



*Almost all fork manufacturers include well-written instructions with their products. Read these carefully before changing any settings or doing any maintenance on your fork.*

If the cable tie has moved along the entire travel range, or if you can hear the fork hit the end of its travel, the spring is too soft and the initial spring tension must be increased (or air pressure added) **(a)**. If the range of adjustment is too small, have the springs replaced by a skilled mechanic.

The adjusting device of the damper is often located at the top and/or bottom of the stanchion, close to the drop-outs or on the opposite fork leg **(b)**. Start with maximum damping and reduce the damping in quarter turns until it is ideal for you.

If the available setting options do not cover your needs, you will need to replace the springs or dampers. Many manufacturers have tuning and retrofitting kits on offer. Be sure only to use components approved of by the manufacturer of your fork.

**a****b**

*Activate the lockout-system **(c)**, if fitted, only on smooth terrain.*



*A fork with too slow rebound damping may cause the forks to no longer rebound when going very quickly over repeated obstacles. This can cause an accident!*



*For more information about adjustment and maintenance please visit the following websites:*

[www.answerproducts.com](http://www.answerproducts.com)

[www.rockshox.com](http://www.rockshox.com)

[www.foxracingshox.com](http://www.foxracingshox.com)

**c**

## Maintenance

Suspension forks are components of sophisticated design and require a considerable amount of maintenance and care. This has led almost all suspension fork manufacturers to establish service centres where customers can have their forks thoroughly checked and overhauled at regular intervals.

The following routines are essential for suspension fork maintenance:

- Whatever type of fork you have, make sure the sliding surfaces of the upper fork tubes are absolutely clean **(a)**.
- Have your local dealer regularly check all bolted connections on your fork.



*Suspension forks are of sophisticated design. Have the maintenance and repair work carried out by a service center authorized by the fork manufacturer. When checking the bolts of the suspension fork, please observe the torques specified by the fork manufacturer and make sure you use an appropriate torque wrench.*



*When buying a new tire for your front wheel, make sure it is not too large. Otherwise it might drag on the fork crown when the fork is completely compressed. In this case the front wheel can get jammed and throw you off your bike.*



*Please read the enclosed manual of the fork manufacturer or visit their website.*



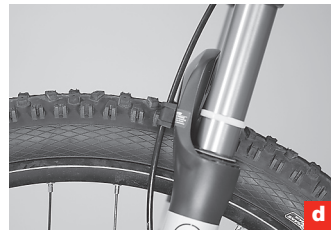
a



b



c



d

## Glossary suspension

Spring rate or hardness:

The force required to compress the spring a given distance. A higher rate indicates a higher force requirement per unit of length. With air springs a higher rate means a higher pressure.

Rebound damping **(b)**:

The damping which controls the rate at which the forks extend after being compressed.

Compression damping **(c)**:

The damping which controls the rate at which the fork compresses (nothing to do with how hard the fork feels).

Sag **(d)**:

The distance by which the rear shock or fork compresses (should compress) when the rider assumes his normal riding position while the bike is stationary.

## The suspension seat post

Suspension seat posts **(a)** enhance the cyclist's comfort when riding on uneven ground. They can be used on roads as well as field tracks.

As a rule, suspension seat posts are designed for a cyclist of average weight, i.e. 75 kilograms. Their shock-absorbing properties can be altered either by adjusting the initial spring tension and/or by exchanging the springs.

Let your FELT dealer do this job!

If you want to try it yourself, read the manual of the seat post manufacturer. Normally, the adjusting bolt is located inside the bottom end of the seat post. To increase the initial tension, turn the bolt clockwise with an Allen key **(b)**. Turn it anticlockwise to reduce the tension, but not beyond the point where it is flush with the seat post end.



*Most seat post manufacturers include well-written manuals with their deliveries. Read them carefully before changing any settings or doing any maintenance work.*



## Check and maintenance

To check the seat post for side-to-side play, take hold of the saddle at both ends and try to move it from side to side **(c)**.

If you notice any play, take it to your FELT dealer.



*Manufacturers recommend servicing the seat post after about 60 operating hours. Ask your local FELT dealer to do this lubrication work.*



## The rear shock

Full suspension bikes are equipped not only with a suspension fork but also with movable rear stays which are sprung and damped by a shock absorber **(a)**. With FELT bikes this normally works with an air spring element. Damping is usually controlled by the use of oil.

### What to bear in mind when adjusting the saddle

Full suspension bikes sag a little when you sit on the saddle. This causes the saddle to tilt a little backwards, an effect which can be compensated by adjusting the position of the saddle. If you have trouble sitting, try lowering the nose of the saddle a little compared to your usual position.



**Full suspension bikes have a greater ground clearance than bikes without rear suspension. If the saddle is adjusted to its proper height you will not be able to reach the floor with your feet. Set the saddle a little lower to begin with and practise getting on and off the saddle.**



### How to adjust the spring rate

With an air shock you have to inflate the rear shock of your bike before your first ride **(b)**. Ask your FELT dealer to do the first adjustment.

Please follow a few simple rules when doing so. The rear shock of the rear swing arm should sag under the rider's weight. When the rear wheel passes through a depression in the ground the spring can then extend and the suspension mechanism will smooth out the uneven surface. If the selected air pressure is too high, this effect is lost because the wheel will already be fully extended. This means the loss of an important feature affecting both safety and comfort.

Cross-country racers usually run less sag than downhillers or more comfort loving freeriders. For cross-country the rear shock should yield by about 10 to 25 % of its total travel when you sit on the bike.

To aid measurement you can use the rubber o-ring **(c)** often available on the shock's shaft, which slides further down the shaft as the rider gets on the bike or slip a cable tie onto the thinner tube of the shock absorber so that you can still shift it easily along the tube.



To measure the maximum shock travel push the rubber o-ring up to the shock body. Then screw on a shock pump to the shock and release all the air pressure. Very carefully compress the rear shock by pressing down on the saddle until it stops **(a)**. Then inflate the shock absorber to the recommended air pressure and measure the distance between rubber o-ring and the shock body. This is the shocks maximum shock travel **(b)**.



*The rear shock should be setup and adjusted in such a way that it rarely reaches the end of its travel (known as bottom out). A spring rate which is too soft (or too low an air pressure) can usually be heard or felt as a “clunk” type noise caused by the sudden complete compression of the shock absorber as it reaches bottom out. If the rear shock frequently reaches bottom out, it will become damaged over time.*



*The mounting of rear shocks on full-suspension frames is designed in a way that the rear shock absorbs shocks from the terrain. If the damper is too rigid or jammed, the terrain induced shocks pass directly into the frame without any damping. The frame is not designed to withstand such undamped stresses. If your bike is equipped with a rear shock including a lockout **(c)**, you must therefore keep in mind not to activate the lockout function when riding in rough terrain, but only when riding over smooth terrain (tarred roads, smooth tracks).*



## Adjusting the damping control

You can adjust the damping characteristics externally (on some shocks) by means of small adjusters **(d)**. This changes the rate of flow of the oil contained within the shock as it passes through valves and chambers internally. Some models provide separate adjustment for the compression stroke and rebound stroke. Experience has shown that it is best to begin with the compression stage entirely open and first adjust the rebound stage.

Adjusting the rear shock is a delicate job, as even a small change on the adjuster can have a big effect. Try approaching the exact setting you need in steps no larger than a quarter turn at a time.

Rebound is considered satisfactory when the rear suspension cycles once after descending from a high curb or a single impact .

Starting from the open position, turn the adjusting wheel in very small steps until you reach the level of rebound that suits you best. Test after each adjustment how the behaviour of the rear shock has changed. If you turn the adjusting wheel too far, the oil will flow very slowly and the rebound will be at maximum. This will result in a sluggish rebound movement, and the rear shock will not recover when exposed to a quick series of impacts.

Turning the adjusting wheel in the other direction reduces rebound, making the rear shock rebound faster.



Once this is done, adjust the compression stage. You will notice the changes in the speed the rear shock compresses. Adjusting the compression adjuster towards the closed or maximum position will give you a firmer less active ride.

Take your FELT bike for a test ride on different kinds of surface. If the rear shock hits the end of its travel (bottom out) several times you will need to change its spring rate or air pressure.



**Do not actuate the lockout function when riding over rough terrain. Use only when riding over smooth terrain (roads, smooth tracks).**



**Do not ride your bike, if the rear shock tends to blow its travel too easily. This could damage the rear shock as well as the frame.**



**Rear shock manufacturers include well-written manuals in their deliveries. Read them carefully before changing any settings or doing any maintenance work.**

For more information on your rear shock model visit the websites of the according manufacturers:

www.rockshox.com  
www.answerproducts.com  
www.dtswiss.com  
www.foxracingshox.com



## Maintenance

Clean the rear suspension thoroughly **(a)** the rear shock, the linkages and the area around the bearings. Do not use a steam or water jet or aggressive cleaning agents!

Regularly check the rear swing arm for side-to-side play and the bearing of the rear shock for vertical play.

To check the rear swing arm for play, lift the FELT bike by the saddle and try to move the rear wheel from side to side. If necessary, ask a helper to keep the front part of the frame still while you do this.

To check the rear shock for play place the rear wheel gently on the ground and lift it again a little. Check for any rattling **(b)**.

If you find any play, ask your FELT dealer to eliminate it without delay.



**Rear shocks are constantly being sprayed with water and dirt from the rear wheel. Clean them with water after every ride**



After washing your mountain bike apply a little lubrication spray to the bases of the rear shocks and to the joints of the connection pieces **(a)**. This provides lubrication and makes for silent riding. Check the secure mounting of the rear shock to the frame.

The swing arm runs on sealed plain or grooved ball bearings which are largely maintenance-free. Using a torque wrench check that the bolted connections securing the bearings and the lower and upper ends of the rear shock are tightened to the correct torque which is either printed on the components or given in the chapter “Recommended torques for bolted connections“.



*If there is a clicking noise, apply a little spray oil to the area around the bearings and shock bases. In case the noise does not stop, take your bike to the FELT dealer.*



*The dismantling of the rear shock is a job best left to your FELT dealer.*

If you want to dismount the rear shock nevertheless, be sure to take good note of the order in which you remove the parts! Arrange them in a row to avoid mistakes when reassembling them. Lubricate the sliding bearings and the rear bases with a non-corrosive resin-free grease when reassembling the rear shock.



*During reassembly, observe the recommended maximum torques which are printed on the components or given in the chapter “Recommended torques for bolted connections“(b)!*



## Things worth knowing about bikes and cycling

### Helmets and protective clothing

Cycling helmets are a must when riding a bike. Your FELT dealer has a large assortment of helmets of different sizes.

Take your time when buying a helmet and keep on the one you prefer for a while before making your final choice. A good helmet should fit snug but without pinching. Pay attention to testing symbols indicating the helmet passed the tests required by the respective standards.

Never ride without a helmet **(a)**! But remember that even the safest helmet is useless unless it fits properly and is correctly adjusted and fastened!

For sport mountain biking, we recommend wearing additional protective clothing, such as gloves, knee, shin **(b)** and elbow pads etc.

Ask your FELT dealer or coach for advice regarding additional protective clothing.



*Please note that though looking easy, the tricks of a professional require years of training and experience.*



### Pedals and shoes

Not all shoes are suited for cycling. Shoes used for cycling should have a stiff sole and provide firm support for your feet. If the soles are too soft, the pedals can press through and cause foot pain. The sole should not be too wide in the area of the heels, as the rear stays or the crank will otherwise get in the way of your pedalling. This will prevent your feet from assuming a natural position when pedalling and may cause knee pain in the long run.

Special cycling shoes are obligatory, if your mountain, road or triathlon bike is equipped with clipless pedals. With these shoes, small cleats are attached to the sole. They firmly attach the shoe to the pedal and are at least reasonably suitable for walking.

The main advantage is that these cycling shoes and clipless pedals prevent your feet from slipping off when pedalling fast or when riding over rough ground. In addition, they enable you not only to push, but also to pull the pedals, which makes your pedalling more fluid and increases the power transmission compared to normal pedals.

The cleat should be positioned so that the balls of your feet rest over the pedal axle **(c)**. Your feet should assume a natural position when pedalling. For most people this means that the heels will point a little inward.





*Read the operating instructions of the pedal and shoe manufacturers carefully. Your FELT dealer will be pleased to help you, if you should have any questions.*

The usual way to engage with the pedal is to turn it to the horizontal using the tip of the cleat (the plate on the sole of the shoe) and push down on the back of it. Some trekking or city bikes are equipped with a one sided lock-in mechanism. Turn this side upwards, in order to clip into the pedal. You will hear and feel a click clearly. Clipless pedals are also referred to as clip-in pedals. On the other pedal side of these pedals, you can use normal shoes.



*Please make sure pedals and shoes are always clear of mud or stones etc.*

With all current systems, the shoe is disengaged from the pedal by twisting the heel outward **(a)**.



*Taking up the pedals, engaging the shoes and disengaging them by turning the heel outward should first be practised stationary. Later you can refine your technique in a place clear of traffic.*

Functional differences between pedal systems concern the shape of the cleat, the release angle and the rigidity of the connection. Cyclists predisposed to knee trouble should choose a pedal system that has some "float", so that the heel can move sideways a little while the shoe is still engaged with the pedal.



*Make sure the fastening bolts are properly tightened, as you will find it almost impossible to disengage your shoe from a loose cleat! There is a danger of an accident in this situation.*



*Only use clipless pedals that allow for you to engage and disengage smoothly. A defective pedal or a badly worn cleat can lead to an accident, as shoe and pedal might suddenly disengage. Sometimes, it might be very hard or impossible to unclip the shoe from the pedal.*



*If your bike is equipped with platform pedals **(c)** for competitive use, they are sharp-edged for a better grip of the shoes. There is the danger of hurting yourself, if you slip off. Be sure to wear protective clothing.*



Your FELT dealer will be pleased to help you with choosing, adjusting and mounting the pedal best meeting your demands.

Adjust the required releasing force according to your needs by turning the small Allen bolt on the pedal **(b)**.

It is advisable to check the condition of the cleats at regular intervals. Replace them, if necessary. If your cleats are equipped with wear indicators, they must be replaced as soon as the indicators are worn down.

## Accessories

There are all sorts of accessories on the market that are intended to increase your pleasure in cycling. There are electronic computers that show your current and average speed, your daily and annual mileage as well as the duration of the present ride. Real deluxe models give the difference in altitude, the cadence or (with a special chest strap) the heart rate of the cyclist.

However, the most important accessories for a successful bicycle ride will always remain an air pump and a small tool kit. The tool kit should include two plastic tire levers, the most commonly used Allen keys, a spare tube, a tire repair kit, a telephone card or your cell phone and a little cash. In this way you will be well prepared in the event of a puncture or some other mishap **(a)**.

Before buying any additional bells, horns or lighting accessories, inform yourself thoroughly whether they are permitted and tested and accordingly approved for use on public roads. Additional battery/accumulator operated lamps **(b)** have to be marked with the correct standards symbols (e.g. wavy line and the letter "K") .

Rear-view mirrors offer better view behind the rider. Make sure they have a solid, anti-vibration mounting before buying one.

Do not forget to equip yourself with a good lock – bicycles are frequently stolen. Your FELT dealer will be pleased to advise you about the various security categories of bicycle locks **(c)**.



**Retrofitted accessories, such as mudguards (d), disc brakes, drum brakes, pannier racks etc. can impair the functioning of your FELT bike. This can result in your losing control and falling off your bike. Ask your FELT dealer for advice before mounting any kind of accessories to your bike.**


**a**

**b**

**c**

**d**

## Transporting baggage

There are various ways of carrying baggage on a bike. Your choice will primarily depend on the weight and volume of the baggage and on the bicycle you want to use. Many cyclists carry their baggage in a rucksack on their back **(a)**. To minimize the effect on your bike's handling and performance there are special rucksacks available designed especially for cycling.

However, there are also many ways of fastening baggage directly to a bike. Ask your FELT dealer for help.

Some FELT bike models allow for the mounting of a pannier rack. FELT strongly advises against transporting a bag or a basket on the top of the pannier rack. It is advisable to carry baggage in stable pannier bags, whose centre of gravity is as low as possible **(b)**.

When buying pannier bags, make sure they are watertight so that your belongings are protected.

Another possibility for the loading of your baggage are handlebar bags. They often have snap buckles for quick mounting and removal. Handlebar bags are particularly suitable for valuables and photo equipment.



Lowrider bags for the front of the bike are mounted to the fork by means of special holders. They are a useful add-on for long tours. They are well suited for heavy items, as they hardly affect the rider's control of the bike. Nowadays, there are lowrider carriers available for suspension forks, as well – ask your FELT dealer.



*Make sure the weight of your baggage is favourably distributed when loading your bike. Heavy items should be carried as close to the ground as possible. Handlebar bags and bags mounted to the top of the pannier rack are only suited for light objects.*



*Do not overload your FELT bike and observe the maximum load bearing capacity printed on or stamped in your pannier rack. Baggage generally changes the riding characteristics of your bicycle and increases your stopping distance! Practise riding your loaded FELT bike in a place clear of traffic.*



*Your FELT bike is not designed for the transport of children or the towing of a trailer.*

## Taking the bike by car / plane

The most convenient way to safely transport your bike is to put it into the boot **(a)** of your car. There, the bike is protected from dirt and any dynamic influences during the transport. Take care to protect the boot of the car. If necessary, line the boot before stowing the bike. Interior fixing systems intended to secure the bike in the boot can be particularly helpful.



*Always secure the bike or bike components when putting it/them into the interior of your car. Bikes and components left unsecured may cause harm to the vehicle's occupants.*



*Disc brakes should have their plastic safety spacers fitted, if the bike is to be transported with the wheels removed. Please ask your dealer about them.*

If transporting the bike inside the car is impossible, nearly every car accessory dealer and car company offers carrier systems which allow for the transport of a bike without disassembly. The usual design involves rails fixed to the roof of the car onto which the bikes are fixed with clamps gripping the down tubes. Do not use such systems with carbon frames!



*Make sure to remove all parts of your bike (tools, panniers, child carriers etc.) which might come loose during transport and cause an accident!*



a



b



*Please make sure the lights and the number plate of your car are not hidden from view. For some carriers, a second exterior rear view mirror is required by the road traffic regulations.*



*Do not buy a carrier on which the bike has to be mounted upside down, i.e. with the handlebars and saddle fixed face down to the carrier. This way of fastening the bike exposes handlebars, stem, saddle and seat post to extreme stress during transport and can lead to failure of these parts!*



*Most clamps are a potential source of damage to large-diameter frame tubes! Suitable, special-purpose models are, however, available in the caraccessory trade. Such carrier systems are unsuitable for carbon frames!*

Whatever system you opt for, make sure it complies with the relevant safety standards of your country!

Read the instructions for your bicycle carrier and observe the maximum loading capacity and driving speed.



*Bear in mind that your car has a greater overall height with the bike on it. Measure the overall height and place a sign stating the height somewhere in the cockpit or on the steering wheel so that it can be easily seen.*



*Never transport bikes with hydraulic brakes upside down. This could let air enter the brake callipers and lead to brake failure.*

If you want to take your bike with you when you go on a trip, e.g. by plane, pack your bike in a special-purpose bike suitcase **(b)**. These suitcases are ideal to help protect your bike from damage. Please follow the suitcase manufacturer's instructions regarding packing.

## Children's bikes

Children are among the most vulnerable of road users - not only because of their lack of experience and skills, but also for the simple reason that they are smaller, making it difficult for them to see things or to be seen.

If you want your child to use their bicycle on the road, you should be willing to invest time in road safety instruction and help them improve their riding skills. Children are not as observant as adults, and you should therefore get into the routine of checking the bicycle and performing adjustments and maintenance as necessary. If you should have any questions, your local FELT dealer will be pleased to help you. Bear in mind that it is your responsibility to supervise your child on their first rides.

Inform yourself about the traffic rules in your area, each country has varying regulations. For example, in Germany, children must use the pavement until they are eight years old and they are permitted to do so until the age of ten!

It is essential that your child has good control of their bicycle before riding on the road. As a first step in this direction we recommend giving your child a scooter or pedal-less bicycle so that they can train their sense of balance.



This being accomplished, you will need to make your child familiar with the functioning of the brakes and gears before you let them sit on the bicycle. Find a place away from the road, ideally a backyard or park, where you can practise braking and shifting gears with your child under your supervision **(a)**.

Once your child has progressed to a point where they can ride in traffic, teach them how to negotiate curbs and other obstacles. Your child should also learn to look around checking for any danger before attempting this kind of obstacle. Your FELT dealer will be able to help recommend useful books to assist in this.

Set a good example by using bicycle lanes wherever possible. It is also advisable to let your child take part in road safety lessons offered at schools or by local clubs and associations.



***Make sure the child always wears a properly fitting bicycle helmet and well visible, i.e. bright, clothing. It is also advisable to wear reflector stripes to increase visibility.***



***Make sure you buy a tested bicycle helmet that the child feels happy with. Take your child with you to make sure you buy one which is comfortable and fits correctly. This will increase the chances that the helmet is actually worn, which might one day be a life-saver (b)!***



***Make sure your child is wearing the helmet while biking only. For example, wearing the helmet at a park or playground can be hazardous; the helmet may get caught on features or obstacles.***



## Adjustment

Adjusting the bicycle to the bodily proportions of a child is even more important than in the case of an adult. In determining the height of the saddle you will need to find a compromise that allows the child to reach the ground with both feet when sitting on the saddle while at the same time giving them enough space for pedalling **(a)**.

Set the saddle to a height where the child's leg is fully stretched when the heel rests on the pedal at its lowest point **(b)**.

As a second test, Make sure the child's knee is slightly bent when the ball of the foot rests on the pedal in this position.

During both tests the child's pelvis should rest horizontally on the saddle (when viewed from behind the seated rider). As a final check, see whether the child can still reach the ground with both feet at the same time when sitting on the saddle. If this is not the case, lower the saddle a little.

Look up the chapter titled **"Adjusting the bike to the rider"** on how to adjust the height of the saddle.



**With children and teenagers check the height of the saddle at least every three months!**



Another condition that can impair the child's riding comfort, is when the handlebars are too far away from the saddle. For this reason, the saddle has been designed to allow fore-to-aft adjustment. Using a spanner or Allen key, unscrew the bolt or nut of the saddle clamp at the top of the seat post by one to two turns.

Do not unscrew the nut all the way, otherwise the whole mechanism may come apart. Push the saddle into the desired position and tighten the bolt or nut again. Make sure the saddle is horizontal and that the ratchet mechanism in the saddle clamp engages when you tighten the bolt or nut. Try to tilt the saddle a little to determine whether the mechanism has engaged correctly. If this is not the case, tighten the nut further.

Make a final check on how securely the saddle is fastened by firmly trying to tilt it.

Now recheck whether the child can easily reach the brake levers.

If this is not the case, adjust the brake lever as described in the chapters titled **"Adjusting the bike to the rider"** and **"The brake system"**.

It is important to tell the child when they practise braking that they should ride more slowly in wet conditions because the road becomes slippery and the brakes can be less effective.

Get into the habit of doing the checks **"Before every ride"** together with your child. In this way, the child will learn to handle the bike properly and you will be able to detect any defects that have developed during use. Encourage your child to tell you, if anything should not be working properly on their bike. Rectify the fault immediately or take the bike in to your FELT dealer for repair, if you are in any doubt.

## Assembling and equipping frame sets

FELT frames can also be delivered plain for individual assembly and fitting **(a)**. Frames are delivered ready for assembly, i.e. with threads cut, bearing shells and seat tube reamed out.

Use high-grade grease, when mounting the components (except for carbon seat posts and stems for carbon forks) to the frame, to inhibit corrosion. Omission of the grease may make future disassembly problematic or impossible.

Road and triathlon frame sets are delivered including fork **(b)**. Observe the fork manufacturer's instructions for mounting carbon fork tubes.



*Whoever assembles a bicycle from a bare frame has to ensure the components are selected and mounted in accordance with the manufacturers' guidelines, generally accepted standards and the state of the art in science and technology.*



*Do not clamp the frame in a workstand by the frame tubes! This can damage the thin-walled tubes. Instead, first mount a suitable seat post (solid aluminium seat post) to the frame and then clamp on this.*

**a****b**

*When mounting a fork to a mountain bike frame, note that the fork crown must be able to turn freely without touching the down tube. If necessary, use a headset which is slightly higher.*



*If you have any questions regarding compatibility of individual parts with the frame, ask your FELT dealer or contact our service department.*



*As a result of continuous innovation and detail improvements, the specifications and required procedures may change. Visit our website and ask your FELT dealer for the details of your frame.*

## General notes on care and inspection

Your FELT dealer will have assembled and adjusted your FELT bike ready for use when you come to collect it. Nevertheless, you have to service it regularly and have your local FELT dealer do the scheduled maintenance work. This is the only way to ensure that all its components function safely and reliably for many miles.



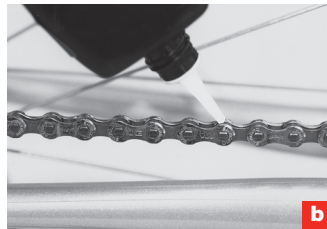
**When working on your bike restrict yourself to jobs for which you are equipped e.g. with a torque wrench (a) and have the necessary knowledge.**



**It is advisable to only use original spare parts or parts approved by the manufacturer. Parts from other manufacturers, i.e. brake pads or tires which are not of identical dimension, may reduce the safety of your bike – increasing the risk of an accident!**



a



b

## Cleaning and caring for the bike

Dried sweat, dirt and salt from riding during the winter or in sea air can harm your bike. You should therefore make a habit of regularly cleaning all its components to protect them from corrosion.

Use of a pressurized water washer is quick, but it also has serious drawbacks. As the water is ejected at high pressure in a narrowly focused jet, it may pass through seals and penetrate bearings. This leads to the dilution of lubricants and consequently to greater friction and the onset of corrosion. This destroys and impairs the functioning of the bearing races in the long term. Steam jet treatment as well as pressurised water also tends to abrade frame stickers. We therefore strongly advise against this kind of cleaning.

A much more gentle way of cleaning your bike is with a low pressure water jet or hose pipe, or with a bucket of water and a sponge or large brush. Cleaning your bike by hand has another positive side-effect: you may discover defects in the paint or worn or defective components at a stage where they may still be able to be repaired.



**Do not clean your bike with a high pressure water or steam jet.**

While cleaning, watch out for cracks, scratches, dents, as well as bent or discoloured material. Have defective components replaced immediately and touch up paint defects. Be alarmed when your rag gets caught on a tube surface. If in doubt about anything you may discover whilst cleaning, see your FELT dealer.

Inspect the chain after you have finished cleaning and oil it (b), if necessary (see chapter on “Chain maintenance”).



**Keep cleaning agents and chain oil clear of the brake pads, sides of the rim and disc (disc brake rotor)! This could impair the functioning of the brakes and cause an accident! For more information see chapter “The brake system“.**

## Sheltering and storing the bike

If you regularly service your bike during the year, you will not need to take any special precautions when storing it for a short time, apart from securing it against theft.

It is advisable to store the bike in a dry and airy place.

There are some things to bear in mind, when putting the bike away for the winter:

Inflated tubes tend to gradually lose air when the bike is not used for a long time. If the bike is left standing on flat tires for an extended period, this can cause damage to the structure of the tires. It is therefore better to hang the bike or to check the tire pressure regularly.

Clean the bike **(a)**, let it dry well and protect it against corrosion. Your FELT dealer offers various care products, such as special oils, spray wax etc.

Remove the seat post and let any moisture that may have entered dry away.



Store your FELT bike in a dry place. Switch the gear to the smallest chainring and the smallest sprocket. This relaxes the cables and springs as much as possible **(b)**.



*There is usually minimal waiting time for repairs and servicing at FELT dealers during the winter months. What is more, many dealers offer annual checks at a special price. Use the off-season to take your bike to your FELT dealer for inspection!*

## Service and maintenance schedule

The bike will be due for its first maintenance after 100 to 300 kilometres or three to six weeks. The bedding in phase typically involves spokes slightly losing tension, cables stretching, gears becoming out of adjustment and bearings settling, so there is every reason to have your dealer service the bike at this stage. This bedding and settling in process is unavoidable. Therefore, remember to make an appointment with your FELT dealer for the first inspection of your new bike. The first inspection is very important for both the functioning and durability of your FELT bike.



*For your own safety, bring your FELT bike to your dealer for its first inspection after 100 to 300 kilometres or three to six weeks, at the very latest, however, after three months of initial use.*

It is advisable to have your FELT bike serviced regularly after the bedding in phase. The schedule given in the table below is a rough guide for cyclists who ride their bike between 1,000 and 2,000 km a year. If you consistently ride more or if you ride a great deal on poor road surfaces, the maintenance periods will shorten accordingly.

Component	What to do	Before every ride	Monthly	Annually	Other Intervals
Bolts and nuts	Check and tighten if necessary		X		
Bottom bracket	Check for play		X		
Bottom bracket	Regrease (cups)			D	
Brake cables	Visual inspection		X		
Brakes (disc-)	Check lever travel, wear of brake blocks, check seals, test brakes while stationary	X			
Brakes (disc-)	Replace liquid (DOT-liquids)			D	
Brakes (drum, roller)	Check lever travel, test brakes whilst stationary	X			
Brakes (rim-)	Check lever travel, wear of brake pads, position of blocks relative to rim; test brakes whilst stationary	X			
Brakes (rim-), brake pad	Clean		X		
Cables of gears/brakes	Disassemble and reapply oil or grease			D	
Chain	Check and grease if necessary, check tension (multi-speed hub)	X			
Chain	Check and replace if necessary				After 1,000 km
Cranks	Check and tighten if necessary		X		
Gear changer/derailleur	Clean and grease		X		
Handlebars, aluminium	Replace				At least every two years

Component	What to do	Before every ride	Monthly	Annually	Other Intervals
Headset	Check for play		X		
Headset	Regrease			D	
Hubs	Check for play		X		
Hubs	Regrease			D	
Lighting	Check	X			
Metal surfaces	Polish			At least every 6 months	
Paint	Polish			At least every 6 months	
Pedals	Check for play		X		
Pedals	Clean and grease locking mechanism		X		
Quick-release	Check seat	X			
Rims with rim brakes	Check thickness, replace if necessary			At the latest after second set of brake pads is worn down	
Seat post	Check torque of bolts		X		
Spokes	Check tension		X		
Stem, seat post	Disassemble and regrease			D	
Suspension fork	Change oil and grease elastomers or springs			D	
Suspension fork	Check and retighten bolts		D		
Suspension seat post	Check for play		X		
Suspension seat post	Service			D	
Tires	Check pressure	X			
Tires	Check tread and side walls		X		
Valves	Check seat	X			
Wheels/spokes	Check for trueness and tension		X		

Jobs marked with an "X" you should be able to do yourself, provided you have a certain degree of manual skill, a little experience and suitable tools, this includes, e.g., a torque wrench. If you come across any defects, take appropriate measures without delay. Your FELT dealer will be pleased to help you, if you have any questions or problems.

**Jobs marked with a "D" are best left to your FELT dealer.**

\*Follow the instructions given in chapter "Special characteristics of carbon".

## Recommended torques for bolted connections

All bolted connections on the components of your FELT bicycle have to be tightened carefully and checked regularly to ensure the safe operation of the bike. This is best done with a torque wrench that disengages as soon as the desired torque has been reached.

Tighten the bolts carefully, approaching the maximum permissible torque in small steps. Check how securely the component is fastened, as described in the respective chapters.

Where no maximum torque is given, tighten the bolts carefully in steps, checking in between the seat of the component as described in the respective chapters.



*Some components have the maximum permissible torque printed on them. Observe these limit values whenever you find them.*

**Be sure to also observe the attached instructions of the component manufacturers!**

Component	Bolted connection	Shimano* Nm	Campagnolo** Nm	SRAM *** Nm
Rear gear changer (Rear derailleur)	Fastening bolt	8-10	15	8-10
	Cable fixing bolt	5-7	6	4-5
	Chain roller bolt	3-4		
Front gear changer (front derailleur)	Fastening bolt	5-7	5	5-7
	Braze-on mount for direct fastening		7	
	Cable fixing bolt	5-7	5	5
Gear / brake lever (RB) (Dual Control / / Ergopower / Doubletap)	Bolt of fastening clamp (Allen bolt)	6-8	10	6-8
	Hole covering	0.3-0.5		
	Bolt of cable stop on frame (screwdriver)	1.5-2		
Gear lever (MTB) (Rapidfire / Trigger)	Fastening bolt for gear shifter pod	5	2.5-4	
	Hole covering	0.3-0.5		
	Clamp fixing bolt (Allen bolt)	5		
	Cable stop on frame	1.5-2		
Gear lever twist grip (Gripshift)	Fastening bolt			1.7-1.9
	Fastening bolt of bar end cap			12
Gear lever twist grip (3-speed Cruiser)	End cap bolt	12		



Component	Bolted connection	Shimano* Nm	Campagnolo** Nm	SRAM *** Nm
Brake levers (Rim brakes)	Bolt of fastening clamp (Allen bolt) Mounting bracket bolt (screwdriver)	6-8 2.5-3		5-7
Hub	Quick-release lever Locknut for adjustment of quick-release hub bearing	5-7.5 10-25		
Free-wheel hub	Sprocket cluster lock ring	30-50	50	40
Crank set	Crank fixing bolt (grease-free square-head) Crank fixing bolt Shimano octalink SRAM GXP Crank fixing bolt Shimano Hollowtech II Shaft fixing bolt Campagnolo Ultra Torque Crank fixing bolt Isis Crank fixing bolt Gigapipe Chain ring bolt	35-50 35-50 12-15    8-11	32-38   42   8	48-54    31-34 48-54 Steel 12-14 Alu 8-9
Sealed cartridge bottom bracket	Shimano Hollowtech II Campagnolo Utra Torque SRAM GXP octalink, square-head	35-50   50-70	  35 70	   34-41
Side-pull brake	Brake pad fixing bolt Cable fixing bolt Fixing bolt of brake	5-7 6-8 8-10	8 5 10	5-7 6-8 8-10
U-Brake	Fixing bolt for cable stop on frame	5-7		5.1-6.8
Seat post	Fixing bolt of seat clamp	***20-29	22	
Pedal	Pedal axle	35	31-34	
Shoe	Cleat bolts Spike	5-6 4		

\* According to Shimano information and tech tips

\*\* According to Campagnolo technical specifications

\*\*\* SRAM operating instructions

\*\*\*\* These values are reference values

**Be sure to also observe the values given in the enclosed manuals of the component manufacturers.**

Component	Shimano* Nm	Magura** Nm	Avid*** Nm
Brake caliper bolt at frame/fork	6-8	6	5-7 (RW) 9-10 (FW)
Brake lever clamp bolt	6-8	4	
Single-bolt clamping			(Juicy 5) 4-5
Double-bolt clamping			(Juicy 7/Carbon) 2.8-3.4
Sleeve nuts on brake lines near lever and normal brake line on caliper	5-7	4	5 Alu-clamping 5 Steel-clamping 7.8
Barbed fittings for brake lines at cable caliper (disc tube)	5-7	6	
Cap bolt	0.3-0.5	0.6	
Setscrew for bleeder hole	4-6	2.5	
Rotor bolts on hub	4	4	6.2



*Be sure to always follow the operating instructions of the component manufacturer when doing any work at the brake system*

- \* According to Shimano information and tech tips
- \*\* According to Magura manuals
- \*\*\* SRAM operating instructions

**Be sure to also observe the values given in the enclosed manuals of the component manufacturers.**

### Torques of add-on parts

Always follow the indicated values on the components **(a)**. In case the torques are not marked on the parts, start with the below mentioned approximate values and increase the torque by half increments until you have reached the upper limit. Never exceed the indicated maximum torque. If you are in doubt, ask your FELT dealer for advice.

#### Seat posts

Block bolt	20-24Nm
Single-bolt patent seat post	20-24 Nm
Double-bolt patent seat post	12-15 Nm
Double-bolt seat post yoke principle	6-7 Nm

#### Stem

Road and triathlon bike	printed on the component
Hybrid bike	printed on the component
MTB	printed on the component

### Torques of frame parts

Rear shock fixing bolts	printed on the component
Bearing fixing bolts	printed on the component
Bottle mount bolts	3.9-4.5 Nm
Seat post clamp bolt	7-8.4 Nm

**a**

## Legal requirements for riding on public roads

FELT bikes are designed to be used on roads free of traffic as well as in open terrain. If you want to use your bike for riding on public roads, it has to be equipped according to the regulations of your country. Ask your FELT dealer to inform you accordingly. Make yourself familiar with the road traffic regulations. Pay particular attention to your bike being equipped with the prescribed lighting set and reflectors **(b)**.

**b****b**

## Warranty and guarantee

### Warranty

Your bike was manufactured with care and delivered to you by your FELT dealer fully assembled.

As initial purchaser in the EU, you have full warranty rights within the first two years after the purchase. Please contact your FELT dealer in the event of defects



*This new warranty law is only valid in the countries where the law has been ratified according to the renewed European regulations! Please inform yourself about the situation in your country!*

In order for your claims to be processed smoothly, it is necessary to present your receipt, your bike card and the delivery receipt. Therefore, please keep these documents in a safe place.

To ensure a long service life and good durability of your bike, use it only for its intended purpose (see chapter **“Before your first ride”**). Please also observe the permissible load specifications. Be sure to follow the assembly instructions as well as the manufacturers' additional instructions given in the table in the chapter **“Recommended torques for bolted connections”** (especially torque specifications for bolts) and the prescribed maintenance intervals precisely. Please observe the tests and work routines listed in this manual and any other instructions that may be included in the delivery (see chapter **“Service and maintenance schedule”**) as well as any instructions on the replacement of safety-relevant components such as handlebars, brakes etc.

Retrofitted accessories can impair the functioning of your bike. Ask your FELT dealer for advice before mounting any kind of accessories on your bike.



## A Note on Wear

Some components of your bike are subject to wear due to their function. The rate of wear will depend on care and maintenance and the way you use your bike (extent of use, riding in the rain, dirt, salt etc.). Bikes that are often left standing in the open may also be subject to increased wear through weathering.

The components below require regular care and maintenance. Nevertheless, sooner or later they will reach the end of their service life, depending on conditions and intensity of use. Parts that have reached their limit of wear must be replaced.

This concerns:

- Brake cables
- The bar tape
- The brake cable housings
- The brake pads
- The chain
- The chainrings
- The gear cable housings
- The grips
- The pulleys
- The saddle covering
- The sprockets
- The tires

- The brake pads of rim and disc brakes:  
These are inherently subject to wear. If you use your bike for competitive cycling or in hilly terrain, they may have to be replaced quite frequently. Check your brake pads regularly and have them replaced by your FELT dealer if necessary.
- Rims with rim brakes:  
Braking causes wear not only to the brake pads, but also to the rims. Therefore check your rims regularly, for example when pumping up the tires. Some rims have wear indicators such as rings, coloured marks or grooves which become visible when the rim has reached its limit of wear. Observe the specifications given on the rim. Ask your FELT dealer to examine the remaining thickness of the rims, at the latest, when you are through your second set of brake pads. Rim walls that become deformed or show hair line cracks when tire pressure is increased have reached the end of their service life, and the rim must then be replaced.
- Suspension components:  
Guides and seals of suspension forks, rear shocks and suspension seat posts wear over time.
- Operational fluids:  
Liquids, such as hydraulic brake fluid along with fluids contained within suspension forks, rear shocks, suspension seat posts decay over time.
- Lighting and reflectors:  
Lighting is essential for your safety on the road, especially at night. Check whether the reflectors are in good working order before every ride. Light bulbs are inherently subject to wear. Always have a set of spare bulbs with you so that you can replace one, if necessary.

## Guarantee

Your FELT bike is guaranteed by the manufacturer for two (2) years against processing and material defects (as of date of purchase to the initial original buyer). In the event that the bike or one of its components shows any processing or material defect within the guaranteed period, FELT will repair or replace the bike.

Guarantee claims for shock absorbers, suspension forks, SRAM or Shimano components or other branded accessories will be processed not by FELT GmbH, but by the component manufacturers' national distributors. Your direct contact in any case should be your FELT dealer, who will be pleased to assist you.

This guarantee only applies to claims made by the initial buyer, who must present the purchase receipt, with date of purchase, dealer address, model and frame number.

In addition, you may register with us online under [www.feltbicycles.com](http://www.feltbicycles.com).

### Guarantee claims will only be accepted if

- the bicycle has been used for none other than its intended purpose;
- the bicycle has had an inspection during its first 500 km or the first six months after purchase;
- the bicycle has been fitted with none other than original spare parts;
- the suspension systems have been serviced once a year by your FELT dealer.



*In some countries you can obtain a longer guarantee period. Ask your FELT dealer for the situation in your country.*

The guarantee does not cover labour and transport costs, nor does it cover follow up costs resulting from defects.

The guarantee does not apply to bikes that have been used in competition, for jumping or which have been subjected to any other kind of overstress.

It does not cover damage resulting from wear, neglect (insufficient care and maintenance), accidents, overstress caused by overloading, incorrect mounting or improper treatment or damage resulting from changes to the bicycle (e.g. mounting or alteration of additional components).

Diligent compliance with the manufacturers' mounting instructions and prescribed maintenance intervals is crucial to a long service life and good durability of the bicycle's components. Failure to observe mounting instructions or maintenance intervals renders the guarantee null and void. Please observe the tests described in this manual as well as all instructions concerning the replacement of safety-relevant components such as the handlebars etc.



***Bicycles that are used on public roads must be equipped according to the regulations of the respective country! This applies in particular to the lighting.***



## Imprint

This manual complies with the requirements of the European standards:

EN 14766

EN 14781

EN 14764

EN 14765

This manual does not help you to assemble a bike from individual parts, to repair it or to make a partly assembled bike ready-for-use!

Technical details in the text and illustrations of this manual are subject to change.

This manual is subject to European law. If delivered to other countries, supplementary information has to be added by the bike manufacturer.

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